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THE HONOURABLE DAVID ELLIOT WILKIE, M.D.: A PIONEER OF MELBOURNE.¹

By HOWARD BOYD GRAHAM,
 Melbourne.

O, roses for the flush of youth,
 And laurel for the perfect prime;
 But pluck an ivy branch for me,
 Grown old before my time.

CHRISTINA ROSSETTI—"Song".

Introduction.

DAVID ELLIOT WILKIE would have become prominent in any company, but his important contributions to the early community life in Melbourne were outstanding and should be recorded. The historians of the Presbyterian Church in Victoria (Ross, 1891; Stewart, 1909; Dixon, 1930; Macdonald, 1927) have noted the zealous support that Wilkie and his relatives gave to the church from its very formation. They also were foremost in the foundation of the first cultural institute in the settlement, the School of Arts and Mechanics' Institute, which subsequently became the Melbourne Athenaeum. David Wilkie was the

¹ Read at a meeting of the Section of History of Medicine, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 26 to 27, 1955.

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leading organizer of the Port Phillip Medical Association, the first president of the Medical Society of Victoria, and an early editor of the first periodical medical journal. For many years he was in the front rank both as a physician in private practice and on the honorary medical staff of the Melbourne Hospital. He was a foundation member of the Philosophical Society, which became the Royal Society of Victoria. He was one of the principal members of the public committee which organized the exploratory expedition of Burke and Wills, and of the other ventures that arose therefrom. Wilkie also had a political career; for a full term of ten years he was a representative of the North Western Province in the Legislative Council, becoming an executive councillor and chairman of committees. By marriage, David Wilkie entered the distinguished family of the Reverend James Clow, and he took an active part in the important social achievements of its members.

The Scottish Background.

David Elliot Wilkie was born in 1815 at Rathobyles in Haddington, the granary of Scotland; a few miles to the east of Edinburgh. The family (Wilkie, 1954) has traced a direct line of descent from James Wilkie of Rathobyles, who died there in 1574. Patrick Wilkie of Rathobyles (1685-1771) was the minister of Haddington. James Wilkie (1736-1789), the second son of Patrick, was a judge of the Court of Scotland. In 1769 James married Anne, daughter of the Reverend Dr. Daniel Macqueen, the

minister of Saint Giles, Edinburgh. Daniel Wilkie (1782-1838), the second son of James and Anne, was the minister of New Greyfriars Church, Edinburgh. In 1809 Daniel married Jane Clerk Elliot of Liddisdale in Roxburghshire, just on the Scottish side of the border. Daniel and Jane had six sons and seven daughters. David Elliot Wilkie (1815-1885) was their third son.

Robert Louis Stevenson (1878) has described how the double church of Old and New Greyfriars stands in the midst of a few homes, alongside an ancient burial ground, on a level place high on a hill "with the tall castle and the tallest of the castle crags in front". Those were the picturesque and romantic surroundings in which David Wilkie grew up. Despite the strong family leaning towards the kirk and the manse, he chose a medical career for himself. In 1836 he became a doctor of medicine of Edinburgh, and he was admitted to membership of the Royal College of Surgeons of Edinburgh. The thesis he presented was "On Acute Pericarditis". The prospectus of the course he took, the nominal roll of graduates, the degree, and the diploma are treasured in Melbourne by his descendants.

The Flush of Youth.

Migration to Australia.

After he had spent two years in post-graduate study in Paris, David Wilkie decided to migrate to the new voluntary colony in South Australia. That colony had aroused considerable public interest in Great Britain. Colonization by freemen, assisted by statutory regulation and protection, in the land of opportunity, appealed powerfully to many of those who were not content to accept the prospects in the homeland. A *Letter from Sydney*, in 1829, had contained the outline of a system of colonization of that kind. It was published by Wakefield (1829) soon after its appearance in the columns of the *Morning Chronicle*. The opportunity to put this novel, attractive scheme into operation presented when Sturt (1833) published the account of his two expeditions into the interior of South Australia. Full debates took place in each of the Houses of Parliament in Great Britain during the passage of the Act of August 15, 1834 (4 and 5 William IV, cap. XCV) to erect South Australia into a British province and to provide for its colonization and government. Many references to the subject matter which appeared in the newspapers and in pamphlets were widely distributed. Many well-known people became shareholders in a joint stock company which was floated to finance the project; £500,000 was raised in £25 shares with provision to double that capital amount. George Fife Angas, a commissioner under the Act, was chairman of this company, which was named The South Australian Company. He was keen to apply Wakefield's principles but was thwarted in that respect. Migrants arrived in the new area from July, 1835, onwards, but considerable muddling and acrimony occurred (Rusden, 1883). The Governor, Hindmarsh of the *Bellerophon*, and the surveyor-general, Colonel Light, could not agree even on the site for the settlement. Light's plan for Adelaide prevailed. Hindmarsh, who had preferred Kangaroo Island, was recalled in February, 1838. An amending Act (1 and 2 Vict. cap. LX) was passed in July, 1838. The new Governor, Colonel Gawler, reached Adelaide in October, 1838. Before the end of that year Dr. Wilkie arrived there as surgeon superintendent of the ship *Lloyd's* bringing migrants. He had intended Adelaide to be his destination, but he was disappointed with the disorganized state of the colony. Hearing favourable reports of the settlement at Port Phillip, he decided to go there instead, and he joined the pioneers at Melbourne on March 10, 1839 (Graham, 1952).

Port Phillip Settlement.

Without delay David Wilkie settled in a cottage on the west side of Swanston Street, Melbourne, just north of Collins Street and opposite the site of the future Town Hall. The cottage was on one of the four allotments purchased for £120 by Captain Henry Howey at the first land sale on June 1, 1837. David Wilkie commenced medical practice there forthwith and was soon assimilated

into the professional and social life of the small community of less than three thousand persons.

In the obituary notice published in *The Argus* a few days after Wilkie's death in 1885 it was stated that he was the second doctor to settle in Melbourne, his only predecessor being the late Dr. William Howitt. This statement is incorrect in several respects. He was not the second doctor to settle in Melbourne. Dr. Howitt's name was Dr. Godfrey Howitt, and he reached Melbourne in April, 1840. It is of historical interest to attempt to establish the facts about the time of arrival and the nature and location of the practices of Wilkie's early colleagues.

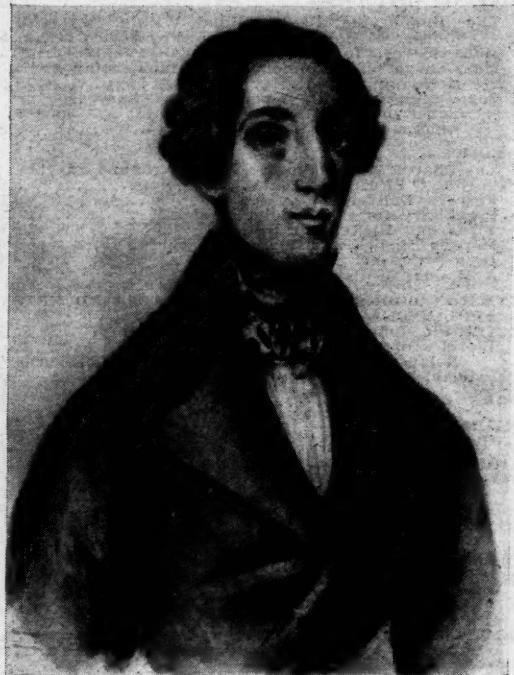


FIGURE I.
David Elliot Wilkie as a young man.

Melbourne's Early Doctors.

Barry Cotter, who arrived at the Port Phillip Settlement on November 6, 1835, has been accepted as Melbourne's first doctor (Howard, 1934). His practice was unconventional and sporadic. He conducted a drug store in which he sold many articles of a general nature as well as those related to medical practice. He was often available to prescribe and to dispense medicines and was qualified to do so. He also carried out the duties of government medical officer. Alexander Thomson reached the settlement in March, 1836, but he does not appear to have practised regularly as a doctor. He soon identified himself with the pastoral, religious and civic development of the Geelong district (Croll, 1927). Jonathan Clarke, who was Gellibrand's manager at Lara in 1836, became Geelong's first government medical officer. There were other medical men further afield (Graham, 1952). Patrick Cussen (1792-1849) came from Sydney in September, 1837, to succeed Cotter as government medical officer. As colonial surgeon he was the first public vaccinator. When he amputated a carpenter's arm on April 4, 1839, he performed the first recorded surgical operation in the settlement. At least at first he increased his meagre salary by practising his profession privately. John Sproat probably arrived in 1838 and he practised privately until 1854. David Patrick and McCurdy preceded Wilkie, and David

John Thomas arrived a few weeks before him. Others who came to Melbourne in 1839 were Farquhar McCrae, who left Leith in the *Middleton* in March (McCrae, 1934), and William Byam Wilmot, the first coroner. Myers and Arthur O'Mullane, Barry Cotter's partner and successor, were practising in 1840. Arrivals in 1840 were Godfrey Howitt and Augustus Greeves in April, Forster Shaw in July, Edward Barker in August, James Frederick Palmer in November, and James Bennett Clutterbuck in December. It was announced in the *Port Phillip Gazette* in 1839 that Wilkie and Patrick became partners in June, and that Cotter and McCurdy joined forces in November.

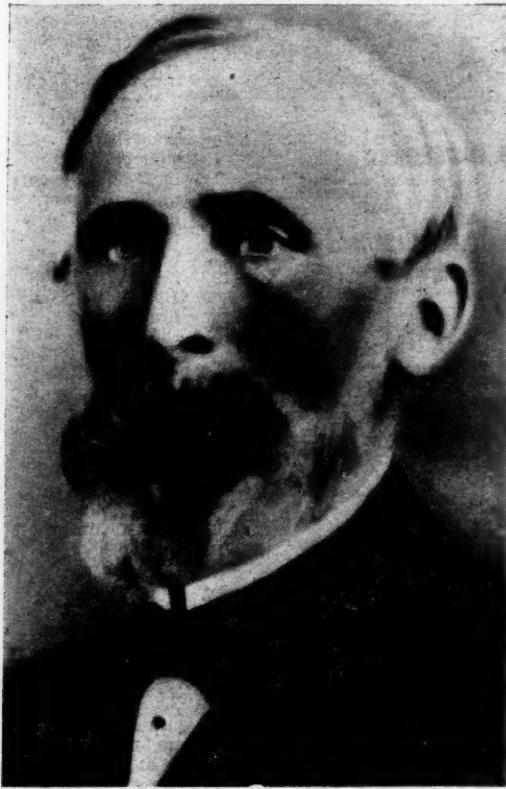


FIGURE II.

Honourable D. E. Wilkie, M.D. (1815-1885). Copy by Peter Fox, Melbourne, of original portrait on porcelain, in possession of family.

Presbyterianism.

Wilkie's partnership with Patrick is an interesting indicator of Wilkie's association with those in the inner circle of Presbyterianism in the young settlement. The Reverend James Clow (1790-1861) and his family arrived in Melbourne on Christmas Day in 1837. He had behind him a notable ministry at Bombay (1815-1833) and his health had broken down (Hamilton, 1937). He had met and corresponded with Dr. Dunmore Lang (1799-1878), of Sydney, who had supplied news of the Australian colonies and of the shortage of ministers there. Clow had already done the spade work to commence a ministry in Melbourne when, on January 28, 1838, the Reverend James Forbes (1813-1851) came from Sydney with an official commission to establish a Presbyterian church. Clow, though probably disappointed, rendered Forbes loyal assistance. A temporary building was soon open for services. It was on the south side of Collins Street West, where afterwards the Oldfleet was placed. Plans for the erection of a

Scots Church were vigorously undertaken. A handsome church, a manse and a schoolhouse were to be erected on almost two acres of land in Collins Street East through to Little Collins Street at the north-west corner of Russell Street. The allotments were 6, 7, 8, and 9 of Block 11. Allotment 6 had belonged to Mr. Yaldwyn, who surrendered it for the purpose of its inclusion in the grant to the Presbyterian Church by the Government of New South Wales (Act 391, gazettes 73, 471 and 77, 1395). Dr. David Patrick and Mr. Robert Campbell were ordained as the first elders in 1839. Campbell was in charge of the first Scots School, which was opened in a temporary building on the site in November, 1838. A two-roomed brick schoolhouse was built there in September, 1839. Church services were held there temporarily and, as the numbers expanded, the wall between the two rooms was removed. Patrick, the leading elder, laid the foundation stone of Scots Church on its present site on January 22, 1841, and the building was opened formally on October 3, 1841. By then James Forbes was in residence in the adjacent manse.

David Wilkie was one of the church managers and was also a manager of the Scots School. In "Kerr's Port Phillip Directory for 1842" (Finn, 1888) an account is given of the schools in the settlement. The Scots School was conducted "mainly on the Glasgow training system under the direction of five managers, annually appointed". They were James Forbes, *ex officio* as minister; James Clow and George Sinclair Brodie, elected by the trustees of the church property; and John Oliphant Denny and David Elliot Wilkie, elected by the contributors.

The Melbourne Athenaeum.

When David Wilkie arrived in Melbourne the only club in existence was the Melbourne Club, which held its first business meeting on January 1, 1839 (Scott, 1936). The members were chiefly military officers and sportsmen. Wilkie was not a member at any time, though several of his medical colleagues identified themselves with it from the beginning. He was, however, closely associated with the second club.

The Melbourne Union Benefit Society, founded on February 14, 1839, proved to be the germ of a remarkable cultural project. The first pamphlet printed in Melbourne (Ferguson, 1951) contains the articles and rules for the regulation of this society. On November 12, 1839, the society was expanded to become the Melbourne Mechanics' Institute and School of Arts (Wilmot, 1939). By 1840 it was known as The Melbourne Mechanics' Institution (Ferguson, 1951). It became The Melbourne Athenaeum on February 10, 1873 (Wilmot, 1939). Wilkie and his immediate coterie took prominent part in the expansion of the original society in 1839. Charles Joseph La Trobe, who had just arrived on September 30, 1839, to take up the office of superintendent of Port Phillip District, accepted the post of patron of the new institute. Captain William Lonsdale (1800-1864), the first administrator of the district, was appointed president. A panel of vice-presidents included Clow, Thomson, McCrae and Yaldwyn. James Forbes was originally the secretary, but the Reverend T. H. Osborne soon took over from him and obtained resident quarters and an honorarium. John Gardiner was treasurer, and Thomas Burns was the first librarian. Dr. Wilkie was appointed to collect and arrange the museum materials, and thus became one of the pioneers of the future National Museum (Ross, 1891). From the tables published in the centenary history (Wilmot, 1939) we notice that Wilkie was treasurer from 1856 to 1878 inclusive; his interest in the institution was not ephemeral. The building was erected on its present site by December, 1842; it is in Collins Street East, on the north side, and not far from the corner on which the Town Hall was first built in 1852. The Melbourne Municipal Council conducted its affairs and held its meetings there as a tenant until the Town Hall was ready. The large upper hall of the institution was used for meetings of religious and other homeless organizations, including those of medical and scientific bodies with which Wilkie was associated (Graham, 1952).

The First Public Hospital.

Melbourne grew quickly, and more and more medical men settled there, but David Wilkie remained in the front rank. In 1840 he became a member of the honorary staff of the first public hospital, which had a department for out-patients and twenty beds for in-patients. His colleagues on the staff were Thomas, Myers and O'Mullane. The hospital at first was in one of Fawkner's houses on the south side of Bourke Street, between Swanston Street and Elizabeth Street. The house was soon too small, and larger premises were found further out of town at the eastern end of Bourke Street east (Graham, 1948).

The Perfect Prime.*Marriage and New Relatives.*

On October 20, 1842, David Wilkie married Mary Clow, the third daughter of the Reverend James and Margaret Clow. Mary was only seventeen years of age and David was ten years older. The Clow family lived on their own property in Melbourne in a prefabricated house which they had brought with them from Scotland. At the land sale on November 1, 1837, Mr. Clow purchased four allotments for £162. They were allotments 10, 11, 12 and 13, of Block 21. He thus owned a frontage of 475 feet along Swanston Street with a depth of 400 feet along Lonsdale and Little Bourke Streets.

In January, 1840, the Reverend William Hamilton, a shipmate in the *North Briton*, married Margaret Clow on the day before her sixteenth birthday anniversary. Mr.

Hamilton was the minister at Goulburn until 1846, when he returned to Melbourne. Soon afterwards he opened a church at Kilnoorat and lived at Cairnlee, near Mortlake. Mr. Clow had a station property as well as the town one. It was known as "Tirhatuan", and the homestead, which remained until 1936, was where the flourishing town of Dandenong now stands. Clow's son James (1820-1894) managed "Tirhatuan" until it was sold in 1850. Later, after a visit to California, he became a police magistrate and gold commissioner for the Wimmera in 1851 and for Ballarat district in 1853. The Melbourne members of the Clow family were often at "Tirhatuan", and David Wilkie must have accompanied them frequently.

Ellen was the other daughter of marriageable age. She was born in 1822, but waited until August, 1845, to marry James Forbes. She was thus the first lady at the manse of the Scots Church.

The Presbyterian Disruption.

In December, 1842, shortly after his marriage, Dr. Wilkie was ordained as an elder along with Dr. Peter Drummond

and Mr. Johnstone. About that time Dr. Patrick returned to Scotland after the death of his wife. Mr. David Ogilvy and Mr. Ballingall then joined the session of elders. Wilkie was thus deeply involved in Presbyterian affairs (Ross, 1891).

Reference to the disruption which occurred during 1843 in the Established Church of Scotland is indispensable, for the events seriously affected the small zealous group of Presbyterians in Melbourne. In the homeland many ministers and congregations seceded to form the Free Church of Scotland in May, 1843. The Australian Synod met in Sydney annually in October. No critical issues

occurred at the meeting in 1843, but the seriousness of the position was clearly appreciated in Australia in 1844. Though James Forbes had an exacerbation of pulmonary tuberculosis in 1843, he emerged as the leader who presented the overture which the Synod of 1844 accepted in principle. Hamilton, Wilkie's brother-in-law, was the mover of the resolution to pursue an attitude of neutrality and to maintain friendly correspondence with each of the protagonist churches in Scotland. Neutrality was found to be quite unacceptable to either of the Scottish parties, and the Australian Synod of 1845 pronounced itself in favour of the Free Church. Forbes was decidedly in favour of that action, but Hamilton was in the minority group which clung to neutrality. The Synod of 1846 reversed the decision of the previous year, and the Australian

disruption ensued. A Free Church Synod was formed by three of the dissentients. Forbes was not present at the meeting, but he could not approve of the swing in favour of the Established Church. In November, 1846, he resigned from Scots Church and opened a free church at the Mechanics' Hall. Seventy members of the congregation, including Dr. Drummond and Mr. Bell, seceded with him (Ross, 1891). Rapidly they built the John Knox Church, which was opened for worship by the middle of 1848 (Stewart, 1909). It was on the west side of Swanston Street opposite the future position of the entrance to the National Gallery. It was sold to the Baptists later.

James Clow and David Wilkie, though they leaned towards the free church principles, stayed on at Scots Church. They took an active part in securing the induction of the Reverend Irving Hetherington, who in February, 1847, entered upon a long and very successful ministry there. William Hamilton sacrificed his charge and home at Goulburn for conscience sake. With his wife, four children, and all their possessions, Hamilton took nine weeks to come overland to Melbourne. They set out on

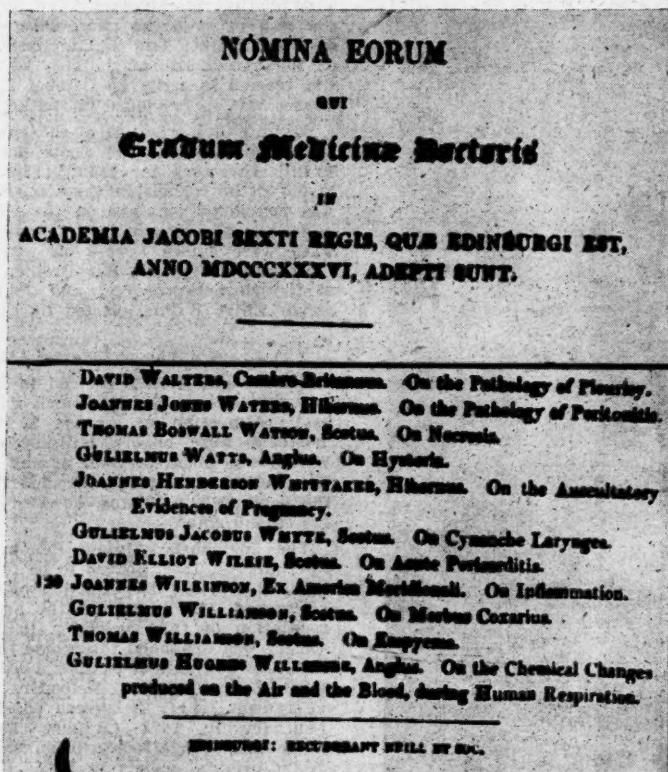


FIGURE III.
Extract from nominal roll of graduates at Edinburgh, 1836.

that arduous journey in October, 1846. Clow and Wilkie stayed with the Established Church. Forbes seceded to the Free Church. Hamilton seceded, but remained neutral and independent; he had the great joy of reunion with his fellow ministers when the united Presbyterian Church of Victoria was formed in 1859.

Forbes, with Hastie of Buninyong, Huie of Geelong, and Henrie Bell, representative elder of John Knox Church, formed the Free Church Synod. Dr. Drummond was the first secretary and treasurer of the Church Extension and Education Committee of the Free Church Synod, which founded Scotch College in 1851. Wilkie and Drummond attended Forbes professionally in his lengthy final illness, which terminated with laryngeal tuberculosis on August 12, 1851.

Organization of the Medical Profession.

Wilkie was a prominent participant in the organization of the medical profession, which commenced on May 16, 1846. He was present at the meeting held on that date which was requisitioned on behalf of the medical fraternity by Cussen, Wilmot and Howitt. He was chairman and secretary of the committee which drew up the very important code of Rules and Regulations of the Port Phillip Medical Association. These happenings of the now long past have already been recorded in detail (Graham, 1952). Wilkie, at first appointed vice-president, became secretary before the first official meeting of that association. He was named first by the treasurer in the original certified roll of financial members, of whom there were sixteen.

The minute book is a treasured possession in the museum of the Medical Society of Victoria. Perusal of it cannot but leave the impression that Wilkie was the moving spirit, the hardest and wisest worker, and a man of great character and honour. Though Cussen was the president, Wilkie often occupied the chair at the meetings, many of which were held at his home. In those days, when competition was keen, ethical rules, which were a novelty, were hard to enforce. He used his great influence tactfully, but failed in the end to be supported by a majority in favour of the ethical rules. On that rock the association founded in 1851, but Wilkie was one of the ten members who stayed with it to the end. His tenacity was rewarded when, on May 7, 1852, he was chairman of the meeting at which the Victoria Medical Association was formed. He was made president of the new association, and in the drafting of the rules and regulations he steered the members clear of the difficulties which had wrecked the old one. Another professional body competed with the association for members and for recognition. It was known as the Medico-Chirurgical Society of Victoria. Many of its members were on the professional staff of the Melbourne Hospital. The association and the society were fused to form the Medical Society of Victoria on July 18, 1855. Wilkie was not in the vanguard of the new society, but he joined the committee at the first annual meeting in October, 1856. He became president in 1858. He then became involved in the political field, but was back on the committee in 1861 as the Honourable David Wilkie, M.L.C.

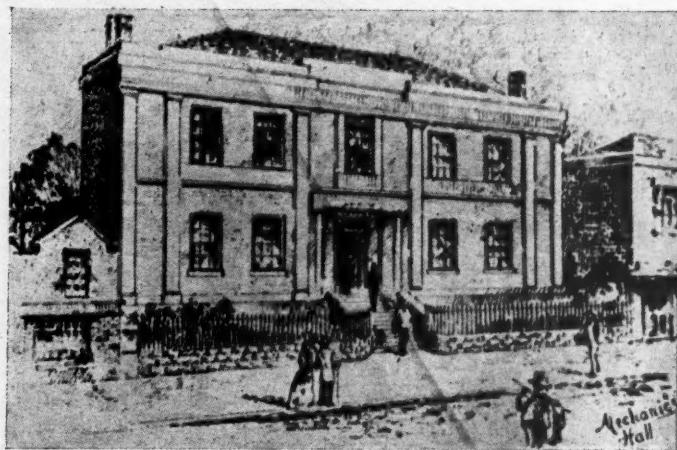


FIGURE IV.
The Melbourne Mechanics' Institution, 1842.

Private and Family Affairs.

Let us hark back to relate some of the details of David Wilkie's private and family life. David and Mary had a large family; they had five sons and five daughters. All of the sons and two daughters were born between 1843 and 1853; the other three daughters were born later. Wilkie obtained a fine allotment in Collins Street east, on the south side, and in 1850, shortly after the discovery of gold, he built one of the first and largest brick residences then to be found in the city. It was known as 106 Collins Street east; after the renumbering of the streets from Spring Street it became 151 Collins Street. There he dwelt and practised his profession for nearly thirty years. It was a bit nearer the central part of the city than was Scots Church, and they were on opposite sides of Collins Street.

In 1855, after parting with "Tirhatuan", Mr. Clow made his home at Oakhill, near Queenscliff, where he built a delightful country bungalow with shady verandas. Oakhill was the scene of many gatherings of members of the family. Wilkie's substantial house in Collins Street was

similarly used as a centre for those of the family from Oakhill who attended services at Scots Church.

There are several references to Dr. Wilkie in "The Chronicles of Early Melbourne, 1836-1851", by "Garryowen" (Edmund Finn, 1819-1898). Finn (1888) refers to Wilkie as one of the best known of the medical practitioners who "had perhaps the largest run of lucrative business of any of them". His "status as a politician never approached that of the physician". Finn describes David Thomas as an incorrigible practical joker. He relates an

anecdote about Thomas when "grogged" at night impersonating Wilkie to his cabby, who called upon the dour Presbyterian elder next day for the fare.

Medico-Political Activities.

With the formation of the Medical Society of Victoria in 1855 the profession was at last able to take stock of legislative requirements, and discussions occurred on various aspects of medical reform. These are reflected in the minutes of the meetings and in the columns of the *Australian Medical Journal*, which was first published in 1856 by a committee of the Medical Society. The Medical Reform Question (Report, 1848) had for long occupied the attention of the medical profession in the United Kingdom. Wilkie became deeply involved in the consideration of local problems of a similar nature which are set out in the early volumes of the medical journal. From 1846 onwards Wilkie had been assiduous in his efforts to secure exclusive recognition for academic qualifications, and he had insisted rigorously on production of diplomas and degrees on application for membership. An Act (No. 14) to extend the provisions of the Acts relating to legally qualified medical practitioners was passed on March 31, 1854. The Medical Practitioners' Registration Bill was introduced in December, 1854, and first read on January 30, 1855; it was ordered to be read a second time that day six months—and it disappeared.

On May 19, 1856, John Maund interested the medical society to initiate desirable legislation for medical reform.

A subcommittee was selected, of which Wilkie was one of the eight members. They drafted a bill, which was debated by the society with Wilkie as chairman. The full text as determined by the society was published in twenty-two clauses, in October, 1856, in the *Australian Medical Journal*. A Medical Bill was before the Legislative Assembly in March, 1858. Wilkie, Tracy and Knaggs were appointed by the Medical Society to draft amendments which were considered necessary. The *Medical Act* of 1862 was the culmination of these activities, but all of its provisions and some of the omissions did not satisfy the members of the medical profession.

To a less extent than was the case in Great Britain, medical reform was delayed in Victoria by a want of unanimity among the medical practitioners themselves. Homœopaths, hydropaths, mesmerists and other septs wished to be protected from competition with unqualified practitioners and, in particular, desired legislation to secure certification of qualified persons for the protection of the community.

The Government of the day was in favour of liberal certification, and even of the acceptance of unqualified persons who had been plying their trade for a few years. Many doctors entered actively into municipal and parliamentary life, and it was not possible for them to speak with one voice for the profession. The long-delayed enactment in Great Britain took place in 1858, and by 1862, when Wilkie was a member of the Upper House, the Parliament of Victoria passed an Act to amend the law relating to legally qualified medical practitioners. In

1865 the Acts of 1854 and 1862 were repealed and they were replaced by one which consolidated them.

Wilkie took an enlightened interest in the Yan Yean scheme to supply Melbourne and suburbs with a water supply. He objected to the principle of supply through pipelines by gravitation from an artificial reservoir. Macadam and Maund carried out many analyses of water samples for the authorities. Wilkie used the information thus obtained to show that the water from the catchment area had a high content of humus and that it dissolved a dangerous amount of lead from the tin and lead alloy used in the pipes. He suggested the use of earthenware channels instead of pipelines, and made many other proposals of a constructive nature. The occurrence of lead poisoning and the instructions to run water off freely at the terminal taps before collecting it for domestic use are two instances showing that Wilkie was justified in repeated advocacy of the need for scientific guidance. The reservoirs were improved considerably, catchment reservations were carefully protected from contamination, and egress channels were considerably extended before the water supply became satisfactory (Wilkie, 1855a, 1855b, 1858).

Wilkie also held firm views on sanitary measures, such as sewerage and food inspection. He studied the legislative measures which were required to safeguard the health of the community from diseases such as dysentery, cholera, diphtheria and smallpox. When one remembers that he belonged to the first generation of physicians who were released from the dead hand of traditionalism and were allowed to think for themselves and act accordingly,

it must be agreed that his leadership was of immense value. In 1859, in a presidential address, his wisdom is concentrated (Wilkie, 1859a). The man emerges as a prophet both of preventive medicine and of the strength of unity.

Medical Activities.

Wilkie practised before the days of specialization, but he was interested professionally chiefly in diseases of women and children. At an early meeting of the Port Phillip Medical Association he gave an address on the alleviation of foetal distress by "elevating the head very considerably during the intervals of the pains" allowing restoration of pulsation of the cord. The date of that meeting was December 1, 1846; the case report was the first scientific communication recorded (Graham, 1952). It was in Wilkie's house that David Thomas, in September, 1847, delivered the account of the successful use of ether by inhalation, which has been erroneously reported as "the first scientific paper" (Graham, 1954; Cowen, 1933).

Wilkie contributed to the brief discussion of the paper on ether inhalation. Of even greater interest is the statement by "Garryowen" (Finn, 1888b) that Wilkie had a share in the first operation under chloroform performed in Melbourne on May 27, 1848. Greeves and Campbell were also present. As Greeves was not of much account professionally and Campbell was an expert surgeon, it is likely that Wilkie administered the anaesthetic.

It has been noted above that Wilkie was an original member of the staff of the first public hospital, but not of the Melbourne Hospital. Even though up his appointment, Wilkie was not selected to replace him. Further, Wilkie published a notice withdrawing his candidature for the staff of the Melbourne Hospital in 1847 in the *Port Phillip Patriot*. In the notice in the *Argus* a few days after his death the statement occurs that "for many years he was an honorary physician to the Melbourne Hospital"; and that statement is repeated in the obituary notice in the *Australian Medical Journal* (April 15, 1885).

Edmund Hobson died before taking up his appointment, Wilkie was not selected to replace him. Further, Wilkie published a notice withdrawing his candidature for the staff of the Melbourne Hospital in 1847 in the *Port Phillip Patriot*. In the notice in the *Argus* a few days after his death the statement occurs that "for many years he was an honorary physician to the Melbourne Hospital"; and that statement is repeated in the obituary notice in the *Australian Medical Journal* (April 15, 1885).

Dr. Wilkie was not prominent in the establishment of the Medical School at the University. The clinical teaching took place at the Melbourne Hospital and he may have had a share in that. He did not, however, take out an *ad eundum gradum* degree at the University of Melbourne with his contemporaries, but did so in 1866. Walter Lindsey Richardson, father of Henry Handel Richardson, was the only other doctor of medicine (and also *ad eundum gradum*) that year (Medical School Jubilee, 1914).

The Political Scene.

With the proclamation of the *Constitution Act* on November 23, 1855, the colony of Victoria attained responsible government. The first election under the new constitution was for the Legislative Council, and was held on August 27, 1856 (*Victoria Government Gazette*, 1951). Dr. Wilkie was unsuccessful in his candidature as a representative of the Central Province. In 1858 he failed again both for that province and also in the North-Western Province. Late in 1858, only two months after defeat, he opposed Mr. W. H. F. Mitchell, the retiring representative, and

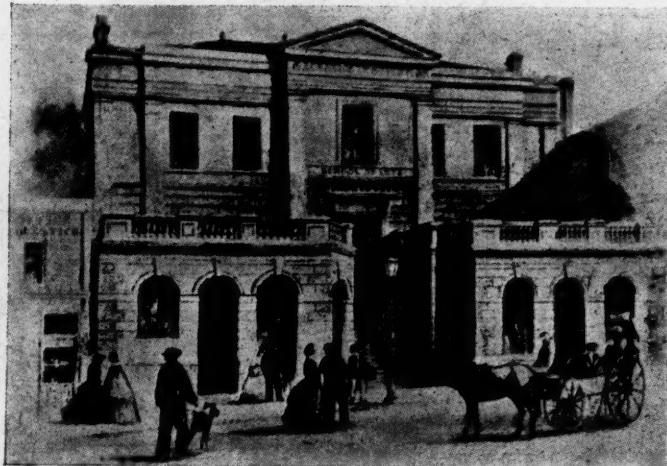


FIGURE V.
Mechanics' Institution and School of Arts, 1857.

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was elected for the North-Western Province for a term of ten years ("Melbourne Directory", 1860). He served for the full term, but was supplanted by Mr. Francis Robertson in 1868.

In his presidential address to the Medical Society of Victoria in 1859, Dr. Wilkie (1859a) mentioned that it had been suggested to him that he should introduce a Medical Reform Bill in the ensuing session of Parliament. He also undertook to render every assistance in his power in promoting an object of so much importance; but he did not introduce the Bill. The only legislation instigated by him was a measure to obtain legal assent to the acceptance of the British Pharmacopoeia instead of the old London one. The members of the Medical Society had discussed the proposed acceptance of the new pharmacopoeia on September 7, 1864, but had decided to await a more perfect edition. On October 23, 1867, at a conference between the medical and pharmaceutical societies, it was resolved that the British Pharmacopoeia would be adopted and recommended on and after May 1, 1868. The *Machinery Act* of 1868, sponsored by Wilkie, was passed.

In 1861, during the Heales administration, Dr. Wilkie became a Minister without office and a Member of the Executive Council. Thereafter he was styled "Honorable". At the opening of the session of 1864-1865 he was appointed Chairman of Committees and retained that office until his retirement in 1868.

He was deeply interested in the proceedings of the Legislative Council and was regular in his attendance, but seldom spoke. His object was to urge the passage of legislation to improve the public health, and it is significant that several important measures were enacted by the legislature during his term of membership of the Upper House.

The National Museum and the Royal Society.

After the gold rush and the separation of Victoria from New South Wales, considerable enthusiasm was shown in the young colony by some ambitious members of the professional group to form scientific societies. Dr. Wilkie participated prominently in these activities.

Dr. Ferdinand Mueller was appointed government botanist in 1852. He displayed rare ability in his special subject and in many branches of abstract science. He was an inveterate collector and classifier of specimens. Dr. Wilkie and several other people were also collectors of specimens of natural history. A close friendship sprang up between Wilkie and Mueller and John Macadam, the government analyst. They thought that the time was ripe to form a national collection. Leadership for this objective was taken by Captain Andrew Clarke, the surveyor-general of the colony. Legislative approval in principle was obtained on September 23, 1853; but the cooperation of a suitable scientific society was regarded as essential. The neighbouring colony of Tasmania had provided the pattern; the national collection was under the guidance and direction of the Royal Society of Tasmania. By March, 1854, Captain Clarke had set apart two of his rooms at the old Assay Office in Latrobe Street west, and in those rooms

the natural history material was collected and assembled. In the following month William Blandowski commenced duty as the salaried collector. The Philosophical Society of Victoria was formed there on June 17, 1854. Wilkie was one of the founders. It is quite clear that it was intended to be the scientific body required to sponsor the national collection (Pescott, 1954).

A Victorian Institute for the Advancement of Science also came into existence at the time. Towards the end of 1855 the two scientific bodies named fused to form the Philosophical Institute of Victoria. In August, 1855, Captain Clarke, in the anniversary address to the institute, announced and defined the project of founding a national museum. The original members of the institute included Clarke, Mueller, Macadam, Wilkie, Swainson the botanist, Selwyn the government geologist, Neumayer the astronomer, and McCoy the newly appointed professor of natural science in the infant University of Melbourne. In

1859 Mueller was president, Macadam was honorary secretary, and Professor Irving was treasurer. Dr. Iflla and the Reverend Dr. John Bleasdale were the vice-presidents. Those office bearers formed a council which also contained Eades, Gillbee, Mackenna and Wilkie from the Medical Society. Other prominent members were the engineers Acheson, Ligar, Hodgkinson and Rawlinson.

It was resolved that the collections for the institute should be considered as the nucleus for the future national museum. It is not surprising, therefore, that strong objection was taken to the determined effort of Professor McCoy to

transfer them to the museum at the signature is third of the five appended to the Memorial of June 11, 1856, from the committee of the Philosophical Institute of Victoria to His Excellency Major-General Edward Macarthur, the officer administering the government of Victoria. The memorialists prayed that the National Museum, instead of being transferred to the University of Melbourne, should be removed to the Public Library Building for choice (Pescott, 1954). Support was obtained from the Public Library Trustees, of whom Mr. Justice Redmond Barry was chairman. Barry was also Chancellor of the University, and he upset McCoy's plans for the nonce. In January, 1858, McCoy was appointed Director of the National Museum, and held the position with great distinction and success until his death in 1899. The National Museum was housed at the University until the end of the century and was then moved to the Public Library building. In 1860 the Philosophical Institute of Victoria became the Royal Society of Victoria.

The Exploration Committee.

Several years after the fate of Leichhardt and his party seemed to be sealed by the clear though circumstantial evidence obtained from the wild blacks beyond the Maranoa, given in 1849 and 1850, Mueller and many others expressed the view that there might be some survivors in unexplored parts of northern and central Australia. An energetic ladies' committee was formed in Melbourne and, on behalf of their mission, Mueller lectured on the possible

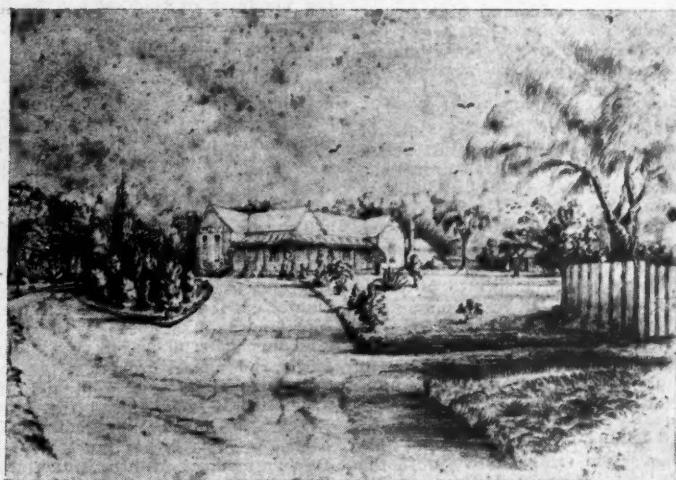


FIGURE VI.
The homestead at Oakhill, the Reverend James Clow's property of 120 acres near Queenscliff, Victoria.

plight of the survivors and the desirability of equipping an expedition to search from Victoria through central Australia to the west or to the north. The Medical Society of Victoria became involved, and Mueller addressed them on the subject. As medical colleagues of the missing Leichhardt they were anxious to help; but as a society they recognized that the project was outside their sphere of operations. On November 11, 1857, the Philosophical Institute of Victoria appointed an Exploration Committee which collected evidence and made plans. Mueller, Wilkie and Macadam were executive members of that committee and, in addition, Wilkie was the treasurer. After consultations with Gregory, Gideon Lang and other experienced people, a decision was made to raise funds to equip and dispatch an exploring party from Victoria, which would have as its objective a passage to the Gulf of Carpentaria to the westward of the previously explored parts of eastern Australia. The funds necessary for the dispatch of the party were raised with difficulty within the appointed time, and in October, 1860, the Burke and Wills Expedition set out with popular acclaim and high hopes. Wilkie, Mueller and Macadam (always named in that order) published seven reports made to the Philosophical Institute (later the Royal Society) respectively in December, 1857, May, 1858, September, 1858, January, 1860, December, 1860, April, 1862, and August, 1863. The expedition, though successful in reaching the Gulf of Carpentaria, was dogged with difficulties and ended disastrously in June, 1861. Wilkie, as treasurer, was responsible for the collection of nearly £58,000 of publicly contributed money, including the expenses of the relief expeditions under Landsborough, Walker and Howitt. The reports are replete with details of human and historical interest of the highest quality. They contain an account of the hazards of exploration and also of those public-spirited individuals who represent the community on executive committees. The exploration committee of the Royal Society of Victoria had to accept adverse criticism which amounted almost to obloquy, because of the deaths of Burke and of Wills, which were the unfortunate outcome of many contributing points of mismanagement which were beyond the control of the committee. With the seventh report, which was entitled the final report, Macadam sent a covering letter addressed to the Chief Secretary of Victoria, on August 20, 1863, informing him that all the papers, note-books, sketches, maps and records were carefully preserved and available (Exploration Committee Reports, 1857-1872).

The committee was seriously embarrassed by governmental irresponsibility and dilly-dallying over financial reimbursements for funeral expenses and the memorial monument. John Macadam died prematurely in 1865. A supplementary final report was prepared by Wilkie, Mueller and James Smith, and it was published on November 19, 1872, over the signature of William F. Stawell, the chairman of the committee. In it we find a record of governmental vacillation and an epilogue on the whole unsavoury affair. Over the years, Wilkie must have been extremely worried and frustrated; with his high standards of duty and exemplary devotion and honesty, it must have been hard for him to accept his share of the blame and the procrastination. Wilkie and Mueller attended the funeral of the sole survivor of the expedition, John King, who died of phthisis on January 15, 1872. In 1874 the original papers of the Burke and Wills Expedition were donated to the Public Library of Victoria (Armstrong, 1906).

Victorian Medical Benevolent Association.

In August, 1864, Cutts proposed to the Medical Society of Victoria that a medical relief fund should be established by annual subscriptions of a guinea. Non-members of the Society were more likely to need assistance. It was considered advisable to form a separate association, so that any member of the profession might obtain relief if in pecuniary distress. The Victorian Medical Benevolent Association was formed later in the year with Cutts as the prime promoter. In February, 1865, Cutts applied to the Medical Society for a financial advance to cover the initial

expenses; but he withdrew the appeal when some members present demurred. Wilkie supported Cutts throughout, and he served as a member of the committee of the association for several years.

The Ivy Branch.

In the obituary notice published in *The Age* a few days after Wilkie's death it is stated that "for the past fifteen years or more he took no part in public affairs". We know from the minute books that Wilkie became inactive in the affairs of the Medical Society. His political career was not resumed after his defeat at the election of 1868. He was probably disillusioned by his experiences with the exploration committee. His health was excellent almost to the end, and he remained actively and busily in medical practice until retirement in 1881.

Medical Board of Victoria.

After the death of Richard Tracy in November, 1874, the members of the Medical Society tried to obtain the privilege of selecting a successor to fill the vacancy on the Medical Board of Victoria, as they had done in 1872. The Chief Secretary would not consent, but tactfully appointed Dr. Wilkie on behalf of the Government. This action allayed the ruffled feelings of the petitioners. Dr. Wilkie resigned in 1878. Membership of the Medical Board has usually gone to senior members of the profession, but always by governmental selection.

More Family Affairs.

The first break in Dr. Wilkie's immediate family occurred when the fifth son, John Malcolm, died in 1861, at eight years of age. All the other children reached adult life and most of them married. In 1873 the first son, Daniel (1843-1915), was married. Daniel and the fourth son, George (1852-1891), were well known as solicitors in Melbourne. The second son, James (1846-1922), was a stock and share broker. He too was married in 1873. The third son, David William Balfour Wilkie (1848-1898), graduated in medicine at the University of Melbourne in 1873. He joined the Medical Society, but remained a bachelor. His father must have been very interested in David's medical training, and the son's assistance in practice must have eased the strain for him. On March 15, 1861, the Reverend James Clow died with dramatic suddenness. On December 26, 1873, after the death of Mrs. Clow, C. J. and T. Ham, the auctioneers, disposed of the four allotments of Block 21, subdivided into twenty-seven lots. The total proceeds of the sale amounted to £77,495 18s. 4d. (Hamilton, 1937).

Business Interests.

Dr. Wilkie retained a political interest as returning officer for the Central Province for the Upper House, and for the electoral district of East Melbourne for the Legislative Assembly. He was a director of the Australian Alliance Assurance Company and of the Land Mortgage Bank of Victoria.

Publications.

A complete bibliography has not been prepared. Some reference should be made, however, to Dr. Wilkie's inventiveness and versatility. The volumes of the *Australian Medical Journal* from the first one onwards for many years contain many contributions from him. Among his inventions was a novel dental lever, which he demonstrated on January 23, 1860, at a meeting of the Philosophical Institute (Wilkie, 1860). He also addressed that body on such diverse subjects as the water supply of Melbourne (Wilkie, 1855a, 1855b) and a new form of propeller for steam ships (Wilkie, 1857, 1861). Professor Edward Ford (1954) has listed four papers which appeared separately. Two are reprints from the *Australian Medical Journal*: "On a Double-Jointed Uterine Pessary" (1863) and "On Delivery on the Right Side" (1863). The other two are pamphlets, being papers read before the Philosophical Society of Victoria in 1855 on the water supply and the failure of the Yan Yean Reservoir.

Conclusion.

In 1881 David Elliot Wilkie retired from active medical practice, sold his house in Collins Street, and removed to East Melbourne, where he continued to see some of his old patients professionally. His robust health was marred by his first illness in 1884; an attack of bronchitis from which he appeared to make a complete recovery occurred then. In November, 1884, he was in excellent health when he left Melbourne with his wife and younger daughters for a visit to Europe. He died unexpectedly in Paris on April 2, 1885. His body was taken to Scotland and was interred at Greyfriars Cemetery.

The story of the valuable life of this sturdy pioneer thus completes a circle. He left Greyfriars, went to Paris, and thence on to Melbourne as a young man. As an old one he left Melbourne via Paris, and rests at Greyfriars. It is curious, too, to note that two spans of three score years and ten separate us from the year of his birth. He lived through one of them. We are remembering him after the other one. The good that some men do lives after them. His steadfastness, his search for truth, and his integrity may still be a source of inspiration for members of the profession he adorned. He strove mightily to bring his colleagues together for the promotion of medical knowledge and a more free professional intercourse. He lived to see the population of the village of his adoption multiply one hundredfold. It has since quadrupled. He, like many another pioneer, thought for us and fought for us. We must never forget them.

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MASS SURVEYS FOR TUBERCULOSIS.¹

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Adelaide.

MANY techniques have been devised for mass screening of populations for the detection of variations from the normal. Clinical screening finds its greatest use in the selection of personnel for the armed forces, for life insurance purposes, and for certain specialized industries; its aim in general is the selection of the normal, rather than the investigation of the abnormal. Biochemical screening has been applied in the main to the detection of diabetes and to the monitoring of persons engaged in hazardous occupations. Immunological screening is applied to the selection of persons suitable for and requiring immunization against various infectious diseases. Radiological screening now finds its main application in the detection of tuberculosis, and the incidental discovery of other chest abnormalities.

Planning a Survey.

In planning and conducting mass surveys for tuberculosis, it is constantly necessary to bear in mind certain basic principles.

The object of mass surveys is to discover persons suffering from tuberculosis in the community, with the dual aims of preventing spread of infection and allowing early treatment of those who require it. Certain other valuable information is obtained from well-conducted surveys. For example, numbers of other important clinical conditions may be discovered as a result of the survey; persons with abnormalities not requiring immediate treatment are brought under regular observation; and the great mass of people can be assured that, for the moment, no abnormality has been found.

The requirements of a screening process are as follows. First, it must give a clear-cut result—that is, it must

¹ Read at a meeting of the Section of Public Health and Industrial Medicine with the Section of Radiology and Radiotherapy, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

answer the question: "Does this individual require further investigation for the condition or group of conditions we are endeavouring to detect, or does he show no abnormality requiring further investigation?" Secondly, the screening process must be sufficiently selective. It must select all those who really require further investigation, and must reduce the whole group to a size which is practicable for further investigation. Thirdly, the screening process must be economical in terms of money and trained staff.

Tuberculin surveys are, in general, clear-cut—though the mass of information which has come from the World Health Organization Tuberculosis Research Office on the criteria for judging a positive response to the tuberculin test shows in striking fashion that the standards of interpretation of this apparently clear-cut reaction need constant and careful watching.

However, in younger age-groups in this country our experience shows that the tuberculin test is certainly selective in reducing the group to a manageable size. Among 3377 Australian-born seventh grade school children examined in South Australia in 1954, only 377 gave a positive reaction to the tuberculin test. The screening process was thus able to exclude 95.5% as not requiring further investigation for tuberculosis, and at the same time to select this group as being suitable for BCG vaccination.

X-ray surveys are also generally clear-cut; but it is true that one reader may think the microfilm findings sufficiently abnormal to require follow-up investigation by large film, while another reader may pass them as normal. When microfilms are read by two observers separately, our experience shows that one reader will fairly constantly recall for large-film investigation a rather greater number of subjects than another, but there is general agreement on what constitutes a probable abnormality or a technical fault in a microfilm.

There may well be disagreement as to whether an abnormality seen in a microfilm is likely to be of tuberculous origin or not; but this is of little importance, as large films are taken of all subjects whose microfilms are reported as showing probable abnormalities.

It is on the large films that an attempt is made to indicate the likely nature of the abnormality.

In the Australian population, X-ray surveys have a very effective degree of selectivity. In South Australian compulsory surveys, 96.6% of films have been reported as showing no abnormality requiring further investigation. It is, of course, important to know whether the remaining 3.4% of subjects in whom the presence of an abnormality is confirmed by large film, contains all the tuberculosis sufferers in the original group who require treatment or further observation. If notification of tuberculosis is reasonably complete, one can get some idea of this. There have been in South Australia in the past three years four cases of tuberculosis notified among persons whose microfilms had previously been passed as of normal appearance, but in which a further check revealed that a probable abnormality was already present when the microfilm was taken.

During the same period 124 cases of tuberculosis were notified as a direct result of abnormalities discovered in compulsory surveys.

These surveys are therefore highly selective, in that they reduce the numbers requiring investigation to a group which can be handled, and which contains approximately 97% of the cases of significant tuberculosis.

X-ray surveys are more expensive *per capita* than tuberculin surveys, but in the adult group they give a great deal more information. The cost in the past year, including microfilms, large films, processing, reporting, and clerical follow-up, has been about 6s. 8d. per person examined, whereas tuberculin surveys have cost about 1s. per person.

We have found it valuable to carry out tuberculin surveys of the under fourteen years age group immediately before the total population X-ray surveys. Children who react to tuberculin are then examined radiologically, and those approaching school-leaving age are offered BCG

vaccination, while adult sources of infection are removed from the community.

Selection of Groups.

A great deal of thought has been given in many places to the preselection of groups for X-ray survey, and a variety of criteria has been used in selecting these groups.

An attempt may be made to select the groups on the basis of likely exposure to infection, in the family, at work, or in the particular locality; by race, occupation or age group; by special risk of spreading infection—for example, those engaged in child care or in hairdressing or food handling; or by occupational hazard to the lungs—hard rock miners. Selection may also be made on clinical grounds—for example, preconfinement patients, and patients attending general hospitals. Finally, selection may be made by virtue of the convenient location of a large body of people—for example, employees of a major industrial undertaking.

Examination of contacts of known subjects of tuberculosis in South Australia is not carried out as part of the X-ray survey campaign, but is administered separately.

The only attempt at racial selection has been the examination of aborigines in the two State aboriginal stations at Point Pearce and Point McLeay. In both of these, total X-ray surveys of the population aged over fourteen years, and tuberculin surveys of those below that age, have been carried out in the past two years.

TABLE I.
Distribution of New Cases of Active Tuberculosis Found in South Australian Compulsory Surveys, March, 1955, to March, 1955.

Site of Survey.	Number Examined.	New Cases.	Ratio of New Cases to Examinations.
Metropolitan area	103,312	75	1 in 1377
Towns over 5000 inhabitants	23,677	18	1 in 1315
Towns under 5000 inhabitants and rural areas	47,591	31	1 in 1535

Little attempt has been made at occupational survey work, except that all recruits for work at Radium Hill have a full-size direct radiograph taken before employment, and a survey at Radium Hill is at present in progress.

Teachers in the Education Department are examined on their enlistment, and with a few exceptions in remote areas the remainder are examined annually.

Preconfinement patients attending public hospitals in Adelaide all have a chest radiograph taken, and private practitioners have been urged to extend this to their midwifery patients.

The rules of the Royal Adelaide Hospital require that each new in-patient admitted shall have a chest radiograph taken, but a number of patients continue to pass through the hospital without having this examination. A constant effort is being made to increase the percentage examined, but a satisfactory result is not likely until a unit is placed in the admission department.

The geographical distribution and occupations of tuberculous patients discovered in South Australian surveys indicate that preselection of groups for survey on anything other than a regional population basis would result in missing many significant cases of tuberculosis, and that total community surveys in both metropolitan and rural areas are well worth while.

Table I shows the numbers of persons examined and the new cases of tuberculosis found in metropolitan surveys, and in surveys in large and small country towns. The ratio of numbers of new cases found to numbers of persons examined is remarkably similar in these three groups.

Table II shows the occupations of the 124 affected persons found, and indicates that occupational selection would be very difficult.

Requirements for X-ray Survey.

Successful survey work demands high quality pictures, adequate interpretation, a reliable identification and record system, appropriate investigation, a complete follow-up system, and thorough organization.

The factors necessary for producing high quality pictures, in our experience, are as follows. First, the technical aspects of the survey should be supervised by an experienced radiologist who has at his disposal a competent supervising radiographer. Secondly, the equipment must be of good quality and design, with photoelectric timing. Thirdly, the standard of dark-room work must be the very highest obtainable. Fourthly, we consider it necessary that the subjects should remove all clothing down to the waist.

TABLE II.
Occupations of Tuberculous Patients Found in Compulsory X-Ray Surveys, March, 1952, to March, 1955.

Occupations of Tuberculous Patients.	Number Found.
Housewives	28
Skilled tradesmen	26
Unskilled labourers	19
Clerical workers	17
Pensioners and retired persons	12
Farmers	6
Businessmen	4
Food handlers	4
Students	4
Professional men	3
Hairdresser	1
Total	124

For several years each roll of survey film in South Australia was interpreted by only one radiologist. It was always thought that double reading, either by two radiologists or by a radiologist and a chest physician, in each case working separately, would give more reliable results. This system has now been instituted, and is working very satisfactorily.

Proper identification of films demands a photo-identification system incorporated in the units.

Confusion of names, particularly with new settlers, is difficult to avoid, and this demands constant care and insistence on the use of full names.

A full discussion of record systems is beyond the scope of this paper. Suffice it to say at this point that the use of a punch-card system is essential for easy preparation of statistical data, and for checking the attendance of subjects at compulsory surveys.

Voluntary and Compulsory Surveys in South Australia.

I wish to turn now to the history of chest X-ray surveys in South Australia, and the results of compulsory surveys over the past three years.

Photofluorography of the chest became available to the civilian population in South Australia in 1941, when the Corporation of the City of Adelaide, in its role as the Adelaide Local Board of Health, set up a 35 millimetre unit. Up to the end of March, 1955, 350,574 examinations had been made.

In 1948, the State Department of Public Health purchased a 35 millimetre unit, of transportable type. At the beginning of 1950 a second unit was purchased. The units were allotted to work, one in the metropolitan area of Adelaide, and the other in rural cities and towns. A third (mobile) unit was added in 1954. The metropolitan unit began by surveying the workers in most of the major industrial establishments in the metropolitan area. In nearly every industry visited, the coverage was almost complete. However, the labour was unrewarding, as only one previously unknown case of active tuberculosis was reported for each 4000 persons examined. The metropolitan unit was also used to examine the patients and staff of

State mental hospitals. These examinations have been repeated annually, but their results are not dealt with in this report.

In 1950-1951 two voluntary community surveys were attempted in the metropolitan area. Despite intensive publicity and good local cooperation, the results were extremely disappointing. In one instance 17% attended, in the other 3.5%.

Meanwhile, the country unit was making voluntary surveys of the major towns of the State, with attendances varying from 35% to 75% of the populations of the towns visited. By the end of 1951, every country town in the State with a population of more than 3000 (except one, whose electric power supply was not suitable) had been visited.

Because of the poor response of the general public to X-ray surveys, and because of the difficulty of persuading a few infectious patients to take proper precautions for safeguarding the health of others, new legislation was passed in 1951, aimed at more effective control of tuberculosis. Under this amending legislation, the Minister for Health became empowered "to order that any groups or classes of persons shall submit themselves to examination of the chest by X-ray". The Act also empowered the Director-General of Public Health, if he "is satisfied that there are reasonable grounds for suspecting that any person is suffering from tuberculosis", to require that individual to undergo further diagnostic examination. A third section of the Act provided as follows:

If a special magistrate is satisfied that any person suffering from tuberculosis is in an infectious condition and that the circumstances in which the patient is living or the habits of the patient are such that there is a substantial risk that he will cause infection to other persons, he may order that the patient be removed to an institution or to some other place agreed upon by the patient and the Director-General and be detained and offered treatment there for such period not exceeding six months as the special magistrate orders.

In February, 1952, the first order for compulsory X-ray examination was made. The order specified that all persons aged from fourteen to sixty-five years living within a defined area of and surrounding the town of Clare should submit themselves to X-ray examination of the chest. Clare

TABLE III.
Attendances at Voluntary and Subsequent Compulsory X-Ray Surveys in Six South Australian Towns.

Place.	Voluntary Survey.		Compulsory Survey.	
	Year.	Number Examined.	Year.	Number Examined.
Port Pirie	1948	7097	1952	9628
Port Augusta	1948	2268	1953	4124
Whyalla	1948	4864	1953	5494
Renmark	1949	2884	1954	4308
Mount Gambier	1950	4002	1953	8555
Naracoorte	1950	2210	1954	4006

is a small and prosperous country town about ninety miles north of Adelaide, and is the centre of a closely settled mixed agricultural area. It was estimated that about 2000 people would be affected, and a period of twelve working days was allowed for the survey. In all, 2058 persons were examined. There was a very small number of expressions of reluctance to be examined, and it was found necessary to send a nurse-inspector to the area during the closing stages of the survey to visit those who were known not to have attended. One anonymous letter of protest appeared in the local newspaper; but the Press and the local authorities concerned gave the survey every support.

The X-ray unit was then moved to Port Pirie, an industrial city of about 10,000 people. With the wholehearted cooperation of the trades unions, the employers and the local authority, the survey was again a complete success, and 9628 persons were examined.

In the Adelaide metropolitan area, compulsory X-ray surveys began in April, 1952, with the examination of those living in two migrant hostels. These were followed by surveys of staff, students and employees of the University of Adelaide, the South Australian School of Mines, and the School of Arts.

The population of a metropolitan municipality was then examined. It was found, however, that electoral boundaries were more satisfactory than municipal boundaries, because electoral rolls provide a ready check of the population aged over twenty-one years.

Early in 1953, in view of the large numbers of abnormalities found in the higher age groups, the upper age limit for compulsory attendance was raised to seventy years. Persons over the age limit are encouraged to attend voluntarily, and numbers do so.

Up to the end of March, 1955, compulsory surveys have been made in 32 centres.

Table III shows a comparison of numbers examined in compulsory surveys in some of these towns with numbers examined in previous voluntary surveys. The increased attendances at compulsory surveys vary from 13% at Whyalla to 114% at Mount Gambier.

In the metropolitan area, the suburbs of Thebarton, Norwood, Hindmarsh, Prospect, Klemzig and Northfield, Glenelg, and Woodville, have been examined. A number of these are relatively crowded, with a good deal of industrial activity. Again, the people have accepted compulsory surveys readily, as a reasonable civic duty, and a valuable public health service.

Full-scale publicity is required to inform people of their duty to be examined, and of the place and times of examination.

Leaflets, posters, signboards and Press advertisements are designed not so much to persuade people as to indicate clearly the relevant dates, times and areas. We find it necessary in metropolitan surveys to deliver to every house a leaflet showing a map of the area and the location and hours of operation of the unit. The leaflet also contains a statement about tuberculosis and its detection and management.

When the survey is over, attendances are checked against electoral rolls to discover apparent defaulters. In small surveys the check is complete, but in some larger populations sampling techniques have been used.

Defaulters are asked by letter if they have any explanation to offer, and are directed to a subsequent survey in a nearby locality.

Two persons have been prosecuted for failure to attend.

Technical Considerations.

Details of equipment and procedure at the units are not discussed here, but certain points call for comment.

It is sometimes stated that the taking of full-size direct radiographs is no longer a necessary part of survey procedure, provided first-class photofluorographs are made. I believe that such surveys have their greatest application in communities where good stationary radiological and chest clinic facilities exist throughout the whole territory. However, South Australia has only one chest clinic, and a limited number of places where good radiographs can be produced. It is therefore necessary for our survey units to take direct radiographs, and equipment suitable to cope with this requirement has been provided.

Subjects are asked, before examination, to give a brief statement of previous chest illnesses, including pleurisy with effusion. If there has been significant chest disease, a direct radiograph is taken at once, so that unnecessary return visits to the unit are avoided.

Films are processed, and read by visiting radiologists and chest physicians at survey headquarters in the Department of Public Health.

All direct radiographs reported as showing abnormal appearances are seen by me. Each patient is then referred to the doctor of his own choice, who receives the film and report, and suggestions for appropriate investigation or observation. If the radiograph suggests the presence of significant tuberculosis, reminders are sent by the Department of Public Health to both patient and doctor until investigation is complete and a diagnosis has been made.

FIGURE I.
Annual notifications of tuberculosis, 1951 to 1955.

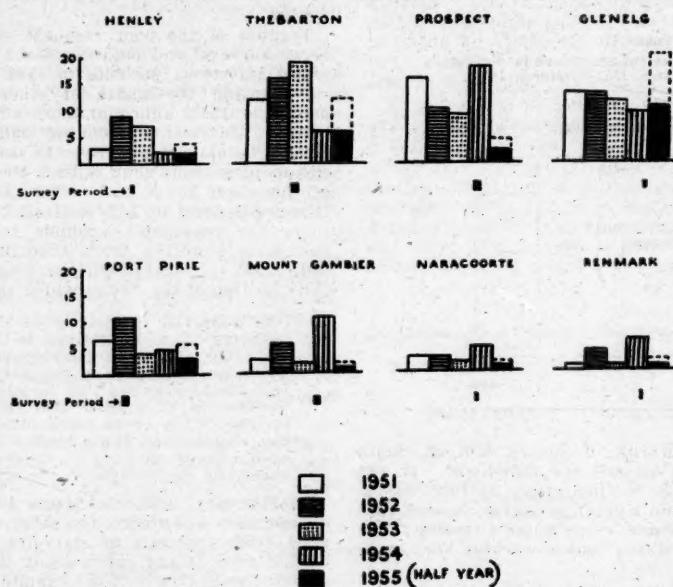


TABLE IV.

Site of Survey.	Total Number Examined.	Large Films.		Tuberculosis.			
		Taken.	Showing Abnormalities.	Not Suspected.	Suspected.	Previously Notified.	New Active Cases.
Metropolitan Towns over 5000 population	109,312	7394	3934	1027	2918	344	75
Towns under 5000 population and rural areas	23,677	1244	540	205	385	31	18
Total ...	47,561	3806	1382	459	928	82	31
	174,580	12,444	5856	1691	4181	457	124

TABLE V.
Persons Examined and New Cases Discovered in Compulsory Surveys, March, 1952, to March, 1955, by Age Group and Sex.

Age Group (Years).	Males.			Females.			Total.		
	Examined.	Cases Discovered.	Ratio.	Examined.	Cases Discovered.	Ratio.	Examined.	Cases Discovered.	Ratio.
0 to 13	2655	2	1 : 1328	2751	—	—	5406	2	1 : 2703
14 to 19	9086	1	1 : 9086	8775	3	1 : 2925	17,861	4	1 : 4465
20 to 29	19,048	8	1 : 2381	16,849	9	1 : 1872	35,897	17	1 : 2112
30 to 39	19,997	20	1 : 1000	19,314	10	1 : 1931	39,311	30	1 : 1810
40 to 49	17,186	23	1 : 747	16,385	9	1 : 1821	33,571	32	1 : 1049
50 to 59	11,869	10	1 : 1187	12,468	6	1 : 2078	24,337	16	1 : 1521
60 to 69	8044	14	1 : 575	8593	2	1 : 4296	16,637	16	1 : 1040
70 and over	911	5	1 : 182	546	2	1 : 273	1457	7	1 : 208
Age not stated	—	—	—	—	—	—	103	—	—
Total	88,796	83	1 : 1070	85,681	41	1 : 2090	174,580	124	1 : 1408

Results.

Table IV shows the numbers of persons examined, the numbers of large films taken, the numbers of large films in which abnormalities were reported, the numbers of new cases of active tuberculosis discovered, and the numbers of previously notified subjects of tuberculosis attending the surveys.

The greater part of the survey work is done in the metropolitan area. The metropolitan population shows a greater proportion of radiological abnormalities than other sections

The greatest numbers examined were in the twenty to forty-nine years age groups, the greatest prevalence of new cases among those examined compulsorily was in the forty to forty-nine years age group, and the greatest density was in the forty to forty-nine and the sixty to sixty-nine years age groups.

The small group of subjects aged over seventy years attended voluntarily. Local doctors were asked to send along those aged people who they thought should attend for X-ray examination. The figures suggest that effective selection was made.

The extremely low prevalence of unrecognized tuberculosis in the fourteen to nineteen years age group is in great contrast to findings reported by the British Health Ministry in 1952, in which the highest prevalence was found in the younger age groups.

The sex distribution shows that the overall prevalence is twice as high in males as in females. In the lower age groups, female rates predominate, but the excess of male subjects in the higher age groups quite overshadows this.

Table VI shows the extent of disease at the time of notification in cases discovered by X-ray survey, and all other new cases notified in the same period.

The proportion of disease of minimal extent is a little higher among the survey cases, and the proportion of far advanced cases is only half that seen in other notifications.

Some attempt has been made to assess the effect of compulsory surveys on the overall picture of tuberculosis notifications in the areas covered. Where survey boundaries correspond closely with local health authority boundaries, it is possible to observe changes in numbers of tuberculosis notifications during and after the survey. A sharp rise in notifications is usually observed during and in the months immediately following the survey. This is followed in the next year by a considerable fall in the numbers of notifications. How long this fall will persist is not yet apparent.

Figure I illustrates this feature for eight surveys, the upper four being in the metropolitan area, and the lower four in country towns.

Table VII shows the present status of the 124 new subjects of tuberculosis discovered in compulsory surveys. Perhaps the most significant fact shown in this table is that of 50 patients discovered prior to the past eighteen months, 39 are now back at work, only one has died, and only four are still receiving a tuberculosis allowance.

Conclusions.

Our experience indicates that in South Australia compulsory X-ray surveys are well received by the public, and that they serve to discover in both the metropolitan and rural areas significant numbers of new cases of pulmonary tuberculosis.

These cases occur in persons of many occupations, but the greatest single affected group are the housewives.

In survey cases the lesions are somewhat less extensive than those discovered by other means; their prognosis is

of the population, and contains a far bigger proportion of persons already in the tuberculosis case registry; but, as was indicated earlier, there is little difference in the proportion of new cases found in metropolitan and rural areas.

For each new case of tuberculosis in metropolitan surveys, almost five subjects with previously reported disease are examined. In rural areas, the ratio is a little

TABLE VI.

Status at June 30, 1955, of 124 Persons Discovered to Have Active Tuberculosis through Compulsory X-Ray Surveys in South Australia, 1952 to 1955.

Status at June 30, 1955.	Year in which Notified.				Total.
	1952	1953	1954	1955	
Remaining in hospital	Nil	3	15	10	28
Living at home:					
Undergoing domiciliary treatment	Nil	2	5	4	11
Totally disabled	1	Nil	Nil	Nil	1
Convalescent after hospital treatment	1	3	19	3	26
Working, or retired on account of age	12	27	15	1	55
Receiving tuberculosis allowance	1	3	20	9	33
Dead	Nil	1	2	Nil	3
Total	14	36	56	18	124

more than two previously known cases to each new one. This reflects the better facilities for the detection and treatment of tuberculosis, as well as the higher incidence, in the metropolitan area, and also the tendency of some country sufferers to move permanently to Adelaide.

The age distribution of persons examined and of persons with newly discovered active tuberculous lesions is shown in Table V.

most instances is excellent. Patients observed for eighteen months to three years show a mortality rate of 2% and a total disability rate of 2%; 8% are still receiving financial allowances for tuberculosis, and 78% have returned to work.

The majority of new cases of tuberculosis in South Australia continue to be discovered by the examination of persons presenting with chest symptoms, and among contacts of known subjects of tuberculosis; but the proportion discovered by mass X-ray surveys has increased each year since compulsory surveys began.

The ratio of new cases discovered to persons with known lesions examined in compulsory surveys indicates that in our community, for every four tuberculous patients on the register, there is one undiscovered case of tuberculosis in the community. The task of the X-ray survey organization is to discover this "unknown 20%" of the tuberculous population.

MASS SURVEYS FOR PULMONARY TUBERCULOSIS.¹

By A. H. MCNAUGHTON,
Melbourne.

IN 1947 the Division of X-ray Surveys in Victoria took approximately 50,000 miniature chest films. The division now takes just on 500,000 miniatures annually. This latter figure appears to be limited only by staff and equipment, for apart from extensive advertising by Press and radio, and by addresses to local organizations, no other form of persuasion has been used.

These chest surveys are State-wide. The mobile machines are transported to all parts of Victoria, with the exclusion of only a few isolated areas where sufficient electrical power is not yet available.

With the experience gained in these surveys it would now appear opportune to consider a few of the general principles controlling extensive routine chest surveys, and some of the problems which must be solved before such a programme can be expected to function properly and efficiently.

Fundamentally, miniature chest surveys were initiated for the purpose of cheaply and efficiently detecting cases of pulmonary tuberculosis in the apparently healthy portion of the community. Of prime importance at the outset was the question of size of miniature film to be used and, after much discussion, it was decided to standardize on 35-millimetre film. One feels that this decision was to some extent influenced by overseas observers, in particular by Birkelo and his colleagues, who, after exhaustive research, came to the conclusion that no particular film size was better than any other, not even a 17-inch by 14-inch film, from the point of view of tuberculosis case finding. In this narrow field one must agree.

However, as our programme progressed, it became more and more evident that the public were accepting one fact only, and that fact was that they had had a chest X-ray examination, and to each examinee a satisfactory result of this X-ray examination implied the complete absence of any thoracic disease. This view, unfortunately, is also shared by a great number of general practitioners. However, we have found that the practitioner, whose cooperation in the campaign is invaluable, can be made aware of the limitations of microradiography. He can be gradually weaned round to the knowledge that, although excellent for the detection of pulmonary tuberculosis, a 35-millimetre film is not capable of detecting with any degree of certainty the early stages of a great variety of other pathological conditions—for example, pneumonokoniosis.

On the other hand, the belief held by the general public is not capable of being altered in any way whatever, and

therefore results and reporting must be tempered by this knowledge.

If the foregoing is borne in mind, miniature chest surveys cover, directly or indirectly, the following services: (i) To find disease, primarily of a tuberculous nature, and to have a responsibility to other forms of disease. (ii) To be organized to refer those patients with abnormalities which are not of a tuberculous nature into appropriate channels for further investigation. (iii) To invite the cooperation of the general practitioner and endeavour to give him, as well as the public, a satisfactory service. (iv) To encourage the potentially well to be health-conscious, and to teach them that early detection of disease means shorter convalescence, the avoidance of undue economic loss, and an increase in their life's expectancy.

These aims may appear very simple and straightforward; but to satisfy both examinee and practitioner means complete team-work and a sense of the utmost responsibility, from the moment of the X-ray examination until the final reading of the film, whether this be the miniature or the follow-up large film.

In Victoria, as has previously been mentioned, 35-millimetre film is used in all survey work. The X-ray units are of a portable type capable of being erected and dismantled in a matter of twenty or thirty minutes.

Before the commencement of each day of a survey, tests of at least three chests and a phantom are taken and developed. This procedure is found to reduce technical faults to a minimum, which in the last twelve months amounted to only 0.86% of miniatures taken. The majority of technical faults are due to mechanical and electrical weaknesses, brought on by the constant erecting, dismantling and transportation of the units. Because of this manhandling, and because of the unnecessary labour involved, I am of the opinion that all units should be fully assembled and mounted in either vans or semi-trailers.

However, the major problem in the conduct of mass surveys is the reading of both large and small films. One feels that for mass survey work all readers, even radiologists of many years' standing, should undergo a short period of training and, throughout their association with the work, be in close contact with their reader colleagues, and have frequent discussions on the findings in both large and small films.

Perspective, judgement and a real knowledge of how much importance the examinee places on his X-ray examination are essential in a reader. These qualities, although present in every radiologist, must be varied to suit the field in which he is working. In mass radiography he must remember that he is not dealing with patients who are referred for an X-ray examination because of an illness, but for the most part with people who believe they are perfectly well.

The miniatures are read by at least two independent readers, and the number read does not exceed 300 at any one session. We in Victoria use both radiologist and non-radiologist for these film readings. The non-radiologists are chest physicians of specialist standing. In either case there would appear to be no expert 35-millimetre film readers. However, there are good readers and poor readers, and the reporting of both groups is influenced to a great degree by the state of fatigue, both mental and physical, present at the time of the reading, as well as by the number of miniatures being read at a sitting. This is one of the principal reasons why readings should be independent. No diagnosis is required, simply an assessment as to whether a large film is necessary or not and, if so, an indication as to the part of the lung field being under suspicion.

It is here that judgement and perspective, of which I spoke earlier, are particularly required. It is easy to recall a person for the taking of a large film; but there is no way of allaying the individual's fear and apprehension until the large film is taken and reported upon.

In a comparison of the results of 17,000 large films with their corresponding miniature readings, it was found that the radiologists had correctly interpreted the minia-

¹ Read at a meeting of the Section of Public Health and Industrial Medicine, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

ture film in 52.69% and had over-read—that is, had asked for a large film when, in fact, no abnormality was present—in 39.07%. The corresponding figures for non-radiologists were: correct, 57.57%; over-read, 34.16%. Both groups missed approximately the same number of lesions—namely, 8.24% and 8.27% respectively.

These figures would tend to indicate that, although there was parity as regards errors of omission, the group with the more practical experience showed a slightly better sense of judgement in recalling examinees.

The "missed case" or "false negative" is, of course, the worst tragedy. Not only is this very serious to the examinee personally, who quite naturally assumes that he is perfectly well, but it also prejudices the health-conscious against public health measures.

Errors of this nature continue to occur, however, even with technically perfect 35-millimetre radiographs, and even when they are read by two independent readers. Unfortunately, in this regard it is found that the demonstration to a reader of a "missed case" results only in excessive over-reading for a period, without any certainty that the particular reader will not miss a similar case in the future.

In a like manner, over-reading cannot be altogether avoided; but because of the practical limitations of 35-millimetre film it is really a necessary evil. In this regard, however, readers should realize that recalls for conditions which are obviously of no importance lead only to unnecessary mental torment on the part of the examinee and in many cases to the expenditure and waste of both money and time. This latter fact is, of course, not so obvious in suburban areas; but in country districts the recall may mean several hours' travel and the loss of a complete day's work.

Although the reading of miniature films is only an appreciation between normal and abnormal appearances, it is more than apparent that all readers must be taught to realize that anatomical variations, old rib fractures, curvatures of the spine *et cetera* are not conditions calling for large films. They must have the courage to regard these appearances as being within normal limits.

In normal radiological practice, when one is dealing with patients referred by their own medical attendant, variations such as the foregoing are naturally noted. In survey work, however, the examinee is usually healthy, and the aim of surveys is to help keep him that way, not to instil in him an unfounded fear that "something is rotten in the state of Denmark".

I have found this tendency to be very pronounced in the case of the cardiac silhouette. "Cardiac enlargement" and "enlargement of the pulmonary conus" are extremely common statements among miniature film readers. Minor degrees of enlargement are of no importance in miniature film work, and in most cases are due to magnification caused by the tube's being only 36 inches from the patient.

It is not our habit to issue any reports on a miniature film; but at the time of each X-ray examination the examinee is given a card stamped with the number of his miniature film. A similar procedure is adopted with large films. These cards appear to be religiously kept by the examinees, and are of inestimable value when reference to any particular film is necessary.

It is only at the time of the large film follow-up investigation that any attempt is made to take a history. This history is brief, relates to the chest, and is recorded by a trained nurse. In addition to this history, and particularly in suburban areas, a Mantoux skin test is performed. Although it is held that this test should be performed on all persons having a large film taken, it is not practical in rural areas because of the inability of many to return for a reading of the test.

If there is any history of contact or suggestion of chest illness, bottles for the collection of sputum are issued. These are returned personally or posted back to us within a few days.

All large films are read by radiologists. The reader is asked to describe the lesion and, having regard to the

brevity of the history, to give a possible diagnosis. In many cases a definite radiological assessment is not possible on the appearance of one large film, and therefore a request may be made either for a further view or for a reexamination after several weeks.

Here again the remarks made in relation to miniature films apply, with equal force, to large films. Radiologists must have the courage to regard, for instance, a small hilar calcification or pleural capping as of no apparent consequence. One of our greatest administrative worries is to prevent such persons from being recalled time and time again by a succession of readers.

It is reasonable, and I think justified, to recall within a few weeks or months for a comparative film and better assessment a person with a doubtful-looking shadow when one is using mainly radiological grounds for diagnosis. In my opinion this is far preferable to referring such persons for full investigation, since nine times out of ten the appearances turn out to be of no importance. The investigation invariably takes place in a chest clinic where persons with "open" tuberculous lesions are numerous. I feel that these persons with very doubtful lesions should not be needlessly brought into open contact with the disease.

Apart from this, however, further films should not be undertaken or advised by a mass survey unit. If after one follow-up film there is still radiological doubt about

TABLE I.

Year; Number of Subjects Radiologically Examined.	Proved and Possibly Active Tuberculosis.	Healed or Quiescent Tuberculosis.	Total Number of Tuberculous Lesions.
1949: 139,893 ..	643 (0.46%) ..	1988 (1.42%) ..	2631 (1.88%) ..
1954: 452,770 ..	621 (0.13%) ..	4198 (0.92%) ..	4814 (1.06%) ..

a shadow, then the subject with the shadow should become a subject for clinical examination and investigation and should be referred elsewhere.

I am also of the opinion that it is completely inadmissible for a radiologist reading mass X-ray films to suggest lines of treatment or further investigation on the appearance of one large film taken in a survey and accompanied by a minimal history.

During the time for which we have been working in Victoria, no attempt has been made to survey individual groups of people or particular trades. Factories are visited in the course of a general survey in a given area, and in these factories the attendance approximates 90% of the employees. Our aim has been to cover the greatest number of the population each year, and our programme is planned on the basis of covering the whole of the State approximately every fifteen months. This, of course, refers to those over the age of thirteen years.

It is undoubtedly that chest X-ray surveys have had an effect on the morbidity of tuberculosis. It is at the same time realized that they do not provide the complete answer to the reduction of occupied beds in our State sanatoria or to the reduction of stay in hospital, but I do feel that they provide the answer to the percentage reduction in notifiable cases.

By finding the persons with early active and open tuberculous lesions the number of contacts infected becomes less, and thus the epidemic proportions of the disease are reduced.

Table I shows a comparison between the numbers and percentages of tuberculous lesions found by the Victorian surveys in 1949 and in 1954. It shows that between these years the percentage of active or possibly active tuberculous lesions dropped by more than two-thirds, and the percentage of the total number of tuberculous lesions by more than one-third.

You will note that the figures for total tuberculous lesions appear rather anomalous. The time interval is obviously too short for there to be such a great reduction

in the number of these cases in the community. The answer would seem to be in the improved reading standards gained by experience and practice. However, this does not hold for the reduction in the number of persons with proved and possibly active tuberculosis, for all patients in this group were closely followed by means of large films and other forms of investigation.

TABLE II.
The Number of Males and Females Radiologically Examined
in Each Age Group in 1955, Expressed as Percentages of the
Total Males and Females Examined.

Age Groups. (Years.)	Percentage of Males Radiologically Examined.	Percentage of Females Radiologically Examined.
0 to 4	0.03	0.03
5 to 9	0.09	0.08
10 to 14	0.95	0.98
15 to 19	14.44	10.46
20 to 24	12.09	10.63
25 to 29	12.70	10.84
30 to 34	10.80	11.80
35 to 39	9.67	10.16
40 to 44	8.04	9.15
45 to 49	7.46	7.34
50 to 54	5.35	6.51
55 to 59	3.71	4.68
60 to 64	2.68	3.76
65 to 69	1.66	2.62
70	1.27	1.72
Unknown	0.05	0.12

With regard to the ages of the examinees attending for X-ray examination under a voluntary system, it will be seen by inspection of Table II that over 50% of both males and females are in the vulnerable age groups of fifteen to forty years, with a gradual tapering off towards the age of seventy years.

TABLE III.

Age Group. (Years.)	Males.		Females.	
	1953.	1954.	1953.	1954.
20 to 24	—	—	—	—
25 to 29	—	—	1	2
30 to 34	—	—	2	1
35 to 39	—	—	3	1
40 to 44	3	4	2	2
45 to 49	6	9	3	3
50 to 54	10	18	2	2
55 to 59	11	7	2	2
60 to 64	12	10	2	2
65 to 69	8	10	2	2
70	7	9	10	9
Total ..	57	73	30	41

TABLE IIIA.

Year.	Number Radiologically Examined.	Cases of Lung Carcinoma Found.		
		In Males.	In Females.	Total.
1953	424,400	57	30	87
1954	452,770	73	41	114

Non-tuberculous abnormalities are, as was previously stated, a big problem and responsibility. Apart from referring this type of patient to his or her own doctor, this division does no further follow-up work, with the exception of carcinoma of the lung. Here we have endeavoured to trace and obtain confirmation of the presence of this condition in cases in which it was suspected on the radiological appearances.

The proved cases of carcinoma of the lung, initially discovered by miniature X-ray films in 1953 and 1954, are shown in Tables III and IIIA. On these cases it can be shown that the ratio of males to females is 1.8:1, and that, whereas in 1953 two cases were discovered in every 10,000 miniature films, in 1954 this number had increased to 2.5 cases in each 10,000 miniature films.

Conclusions.

Mass miniature chest radiography is of undoubted value in reducing the number of "silent" cases of active and open tuberculosis in the community.

Frequent repetition of chest X-ray examinations is essential to keep these cases at a minimum.

For full efficiency, X-ray units used for surveys should be assembled and mounted in either vans or semi-trailers.

To maintain the full confidence of the potential examinee, the film size should be such as will aid the detection of early conditions other than tuberculosis.

The investigation and treatment of these other conditions should not form part of the survey programme.

Readers need some primary instruction on the aims and limitations of mass chest radiography. Part of their duties should include the close examination and comparison of all large films and their corresponding miniatures.

Acknowledgements.

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SOME ASPECTS OF MASS X-RAY SURVEYS FOR TUBERCULOSIS IN NEW SOUTH WALES.¹

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TUBERCULOSIS still remains one of the most important public health problems. The general world-wide fall in tuberculosis mortality, which began many years ago, has been considerably accelerated since the introduction of chemotherapy, but has not always been accompanied by a decrease in morbidity. It can be seen from Table I and Figure I that during the past four years the number of deaths in New South Wales has decreased by 45%, and in the same period the number of notifications has increased by 19%.

The visible gap between the fall in mortality rates and the increase in the number of cases notified can be accounted for by the effective case-finding programmes conducted in this State.

A total of 1,333,796 persons were radiologically examined in 1953 and 1954 by the Anti-Tuberculosis Association of New South Wales and the New South Wales Department of Health, as shown in Table II.

Table III shows the important part that mass surveys are playing in the detection of unknown cases of tuberculosis in the community; in 1954 43.19% of all notifications came from this source.

Great progress was made in mass surveys as a result of the Commonwealth and New South Wales Governments' tuberculosis arrangements. The Anti-Tuberculosis Association of New South Wales began community-wide surveys in the Sydney metropolitan area on April 30, 1953. A

¹ Read at a meeting of the Section of Public Health and Industrial Medicine with the Section of Radiology and Radiotherapy, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

detailed analysis of the first mass survey of the city of Sydney was published (Rubinstein, 1955). The rate of active cases (0.18%) found amongst the 192,297 persons radiologically examined was higher than in any other municipality surveyed subsequently.

Between October 20, 1953, and December 3, 1954, the city of Parramatta and 19 municipalities in the metropolitan area were surveyed. The estimated population (census, 1954) of the areas surveyed was 1,060,906.

TABLE I.

Annual Number of Deaths from Tuberculosis (All Forms) and New Cases Notified Between 1951 and 1954 in New South Wales.

Year.	Number of Deaths.	Number of Cases Notified.
1951	630	1743
1952	495	1803
1953	409	1896
1954	348	2156

TABLE II.

Year.	Anti-Tuberculosis Association.	Department of Health.	Total.
1953	370,693	126,630	497,323
1954	587,744	248,729	836,473
Total ..	958,437	375,359	1,333,796

By proclamation it was made compulsory for all residents of each declared area, aged fourteen years and over, to attend for an X-ray examination, free of charge. Persons who had had a chest X-ray examination within the previous twelve months were exempt.

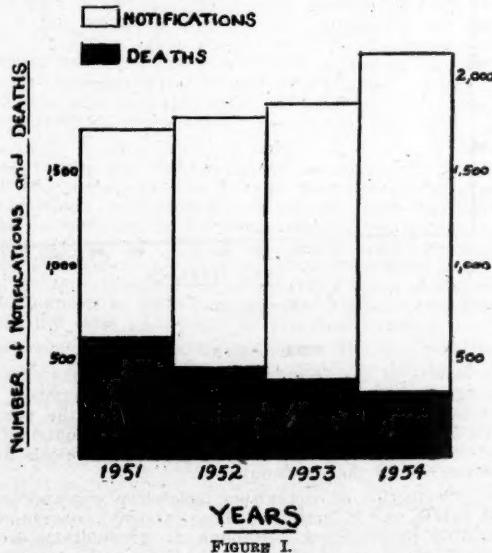


FIGURE I.

Four mobile X-ray units operated on five days a week from 9 a.m. to 9 p.m. continuously. A total of 620,739 persons were radiologically examined. There were 279 working days, an average of 2585 X-ray films per day being taken by the four units.

The general results of the surveys may be set out as follows:

1. The number of persons radiologically examined on a miniature film was 620,739. Of these, (i) 1381 had a

technically unsatisfactory film and did not attend for a reexamination; (ii) 817 with a probable abnormality did not attend for a reexamination on a large film.

2. The number of persons radiologically examined on a large film was 11,637. Of these, (i) 2155 had normal X-ray appearances; (ii) 737 (0.1%) were found to have active

TABLE III.

Source of Discovery of Cases of Tuberculosis Notified in New South Wales During 1954.

Source of Discovery.	Number of Cases Notified.	Percentage.
Mass X-ray surveys :		
Department of Health	220	10.21
Anti-Tuberculosis Association	931	32.98
Chest clinics	711	43.10
Private practitioners	486	22.54
Other hospitals	292	13.54
Repatriation Department	187	8.67
Sanatoria	162	7.51
Death certificate ¹	21	0.98
Other	70	3.25
	7	0.32
Total	2156	100.00

¹ Death certificate notifications represent cases which have not been notified prior to death.

tuberculosis—(a) 696 of these infections were new, (b) 41 were old; (iii) 6685 (1%) cases of inactive tuberculosis were found, and in 2998 of these fibro-calcific scars were present; (iv) 2060 (0.3%) subjects were found to have non-tuberculous disease.

TABLE IV.
Laboratory Findings in New Active Cases.

Type of Investigation.	Positive Result.	Negative Result.	Result Not Available.
Sputum :			
Direct smear examination	106		
Examination of concentrated deposits	164	559	
Culture	280	8	
Gastric contents : culture	70	12	
Total	629	20	47
			696

To give a more accurate picture of the prevalence of active pulmonary tuberculosis in apparently healthy persons, the statistical analysis is presented separately for new active cases only.

TABLE V.

Stage of Disease.	Males.	Females.	Total.	Percentage.
Minimal	103	63	166	24
Moderately advanced	298	150	448	65
Far advanced	64	18	82	11
Total	465	231	696	100

The laboratory findings in the new active cases are set out in Table IV. There were only 20 cases bacteriologically not proven, in which the lesions were radiologically unstable. The results in 47 cases were not available.

Analysis of the extent of the disease shows that only 166 cases (24%) were detected in the minimal stages.

From Table VI it can be seen that the total number of new active cases of tuberculosis found among males was double that among females. It is also of interest that among females 141 cases were found in the group under the age of forty years, and 90 cases among those aged forty years and over, and among males the incidence of

occupations of the following persons: hairdressers, nine; waiters and stewards, six; barmmaids and waitresses, four; butchers, three; breadcarters, four; liftdrivers, three; teachers, two; cooks, two; dentist, one.

TABLE VI.
Number of New Active Cases of Tuberculosis Detected in Age and Sex Groups.

Age Group. (Years.)	Males.	Females.	Total.
14 to 19	5	11	16
20 to 24	9	23	32
25 to 29	20	38	58
30 to 34	28	30	58
35 to 39	40	39	79
40 to 44	30	15	45
45 to 49	61	18	79
50 to 54	60	10	70
55 to 59	58	16	60
60 to 64	46	12	58
65 and over	113	19	132
Total	465	231	696

active cases was three and a half times higher in the latter group than among those aged under forty years (364 and 101 respectively).

Figure II illustrates graphically the incidence of new active cases among males and females in five-year age groups.

TABLE VII.
Country of Origin of New Patients with Active Disease.

Country of Birth.	Males.	Females.	Total.
Australia	335	198	533
United Kingdom	90	16	106
New Zealand	9	3	12
Europe	22	12	34
China	3	1	4
Others	6	1	7
Total	465	231	696

TABLE VIII.
Occupation of New Patients with Active Tuberculosis.

Occupation.	Males.	Females.	Total.
Group 0: Rural workers	8	—	8
Group 1: Professional and semi-professional workers	4	1	5
Group 2: Administrative workers	20	—	20
Group 3: Commercial and clerical workers	45	30	75
Group 4: Domestic and protective workers	51	5	56
Group 5: Craftsmen	70	3	73
Group 6: Operatives	126	15	141
Group 7: Labourers	51	—	51
Group 9: Not gainfully employed (retired, pensioners, home duties)	90	177	267
Total	465	231	696

Tables VII, VIII and IX illustrate the country of birth, occupation, and disposal of all patients with new, active lesions detected in the surveys.

A large number of persons found with active and infectious disease were in constant contact with the public—for example, shop assistants, tram conductors *et cetera*. Of special interest because of the public health risk are

TABLE IX.
Disposition of Patients with New Active Disease.

Where Sent, or Present Status.	Number of Patients.
Admitted to sanatoria or chest hospitals	268
Admitted to Repatriation General Hospital	109
Domiciliary treatment	249
Working	31
Deceased	5
Not known	34

It may be noted from Table IX that a relatively large number of patients underwent domiciliary treatment. In most cases such treatment with chemotherapy was arranged particularly for elderly persons whose home conditions were satisfactory and who refused institutional care.

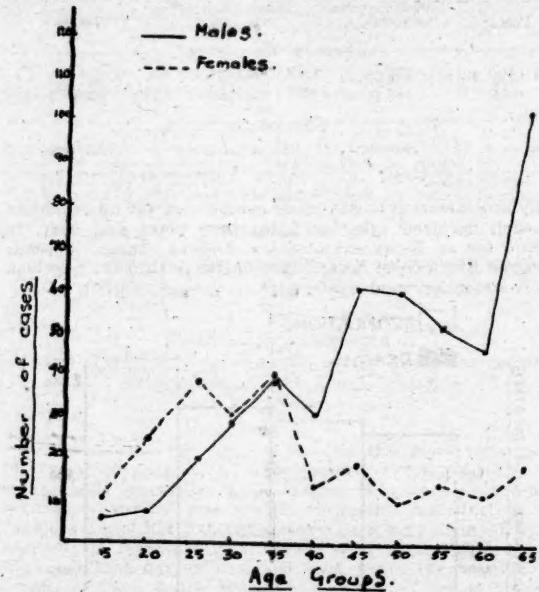


FIGURE II.

Discussion.

The results of the recent mass surveys for tuberculosis conducted in New South Wales answer a number of questions as to their value. They revealed all the potentialities in the detection of unknown cases, and contributed to the improvement of our knowledge of tuberculosis and its prevalence in the community.

The introduction of compulsory legislation was approved by the public, and it facilitated these extensive tuberculosis case-finding programmes. Although no prosecutions were instituted, the number of persons radiologically examined was most satisfactory. It was possible to ensure that a substantial proportion of older people were examined; that they constitute a most important source of infection was confirmed by our findings.

Wunderly (1954) considers mass miniature radiography the only practical means of detecting probable tuberculosis amongst the apparently healthy members of the community. As a public health measure the detection of all infectious cases of tuberculosis is most essential, as undoubtedly the unknown cases are responsible for the spread of infection.

There are two recognized methods of carrying out mass X-ray examinations: (i) "selective" screening of various groups showing some evidence of special risk; (ii) "community-wide" surveys covering the entire population of a country, district or town. In several countries "selective" and "community-wide" surveys are conducted simultaneously. Often only selective screening is carried out through lack of financial and technical resources. Great difficulties are encountered in overcoming the unwillingness of the population to attend community-wide surveys on a voluntary basis. Cochrane (1954) states that large-scale surveys in Great Britain could not be completed at reasonable cost without the introduction of some legal sanction.

Several statistical studies have been published proving that the yield of tuberculosis in surveys of certain selected groups is very high, particularly among patients attending private doctors or out-patient departments of general hospitals. It is also universally agreed that regular chest examinations of contacts, nurses, students, workers in dusty occupations, pregnant women *et cetera*, are essential. An annual chest X-ray examination should be a condition of employment for persons whose work, should they be suffering from an infectious condition, would constitute a public health risk—teachers, hairdressers, food handlers *et cetera*. Some authorities believe that surveys of selective groups could be more economically and effectively used.

The Sub-Committee on Mass Radiography of the International Union Against Tuberculosis (Bulletin, 1954) advised that the ideal method would be to submit the entire population to X-ray examinations in order to detect all the unknown cases of pulmonary tuberculosis, which represent the main factor in the spread of the disease. This does not imply that certain selective groups should not receive particular attention at the same time.

It has been found in the mass surveys in New South Wales that no section of the community was exempt, and that the highest incidence of active new cases was detected in overcrowded districts. It is doubtful whether a large proportion of the patients could have been reached in time, except by the community-wide surveys. The effectiveness of the campaign can best be judged by the large number of active cases discovered, most of them being confirmed bacteriologically with the exception of a few in which the radiological lesions were unstable. A number of patients with lesions considered on X-ray appearances to be "stabilized", proved to be infective on routine sputum tests.

The reasons for the non-detection of these patients earlier can be explained as follows. One group of patients was completely asymptomatic; a second group considered themselves well, but on being questioned admitted certain vague symptoms; and a third group consisted of obviously sick persons under treatment for various conditions (bronchitis, asthma, peptic ulcer and anxiety state *et cetera*), whose diagnosis of pulmonary tuberculosis was established for the first time as a result of the mass surveys.

When the mass surveys commenced, the criticism was voiced that there were inadequate beds for admission to hospital for new patients who would be discovered. It was possible to arrange for practically all patients found in the recent surveys to undergo treatment in an institution or at home. Great care was taken not to disturb patients unless it was proved that they were suffering from active disease, confirmed bacteriologically, and in definite need of treatment. At the same time, arrangements were made to follow-up regularly the large number of patients found with inactive disease. As a result of efficiency and speed in reading films, in sending out notices and in arranging interviews, anxiety and worry were reduced to a minimum.

The mass surveys conducted in New South Wales are also of important epidemiological interest and should be of great assistance in defining the groups in the community most seriously affected. The second community-wide survey of the same areas now taking place after two years' interval should be of value in estimating the incidence of new cases. It is expected that as a result of the successful mass surveys for tuberculosis conducted

in New South Wales, the morbidity rate will begin to decrease coincidentally with the fall in mortality and will lead to the ultimate control of tuberculosis.

Summary.

1. The trends in tuberculosis mortality and morbidity in New South Wales between 1950 and 1954 showed a substantial decrease in the number of deaths (45%) and an increase in the number of notified cases (19%).

2. A total of 1,333,796 X-ray films were taken by the Anti-Tuberculosis Association of New South Wales and the Department of Public Health in 1953 and 1954.

3. Of all notifications of tuberculosis in 1954, 43.19% came from mass surveys.

4. The findings of mass surveys for tuberculosis conducted in the city of Parramatta and in 19 municipalities in the Sydney metropolitan area are presented. The number of persons radiologically examined was 620,739. An average of 2583 X-ray pictures was taken per day on four units.

5. Six hundred and ninety-six persons with new active disease and 41 with a history of previous tuberculosis were found (0.1%); 6685 cases of inactive disease (1%) and 2060 (0.3%) cases of non-tuberculous disease were detected.

6. Details of laboratory findings, stage of disease, distribution in age groups, country of birth, occupation, and disposal of new patients with active disease are presented.

7. The relative merits of "selective" and "community-wide" surveys for tuberculosis are discussed.

8. The effectiveness of the mass surveys in New South Wales can be judged by the large number of cases of active disease discovered.

Acknowledgement.

I wish to thank the Director-General of Public Health and the Government Statistician of New South Wales for making statistics available, and Mr. E. H. Badgery-Parker, President of the Anti-Tuberculosis Association of New South Wales, for permission to publish this article.

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Reviews.

Tea: A Symposium on the Pharmacology and the Physiologic and Psychologic Effects of Tea. By Henry J. Klaunberg, Ph.D.; 1955. Washington: The Biological Sciences Foundation, Limited. 9" x 6", pp. 68. Price: \$1.00.

TEA as a beverage has been known since very early times, and more tea is drunk in the world than any other fluid except plain water. Man has changed his habits much in the fifty-seven centuries, but his appreciation for tea has been retained over the whole of this period. Tea, then, is clearly something more than an aqueous infusion of caffeine and tannins. In itself it has almost no food value except for the small amounts of certain vitamins and minerals. No serious effort has been made to organize the research and clinical literature on tea for the use of persons interested in human nutrition and physical fitness. In order, in some degree, to make up for this lack, a symposium was held in May, 1955, at the New York Academy of Sciences, when eight papers were given on different aspects of the effects of tea drinking. The papers are published in a small volume of 64 pages entitled "Tea: A Symposium on the Pharmacology and the Physiologic and Psychologic Effects of Tea". It is curious that this should come from the United States, where such dreadful tea is made, and nowhere in the book is any indication given as to how tea should be prepared. There is little that is original in the book and a great deal of overlapping occurs in the different papers. The original

observations are in two papers, "The Effect of Tea on Gastric Secretions and Motility", by C. W. Wirts, M. E. Rehfuss, W. J. Snape, and P. C. Swenson, and "The Psychophysiological Effects of Tea", by W. C. Stanley and H. Schlosberg. The greater part of the first paper appeared in *The Journal of the American Medical Association* for June 19, 1954, and this was commented on in this journal. The other papers contain little that is not common knowledge. To sum up, the consensus of opinion is that tea is a pleasant beverage which is mildly stimulating and seldom or never does any harm. This is an interesting little book for anyone who wants to have what is known about the effects of tea in a small volume, but it could all have been done a lot better.

Forceps Deliveries. By Edward H. Dennen, M.D., F.A.C.S.; 1955. Philadelphia: F. A. Davis Company (Publishers). 9 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ ", pp. 242, with 91 illustrations. Price: 17s. 6d.

Here we have, in great detail, many different ways of applying obstetric forceps to the fetal head. The author considers that the obstetrician should choose the forceps for each particular case, rather than use one pair of forceps for every case; hence he gives, with many excellent illustrations, the correct application of straight, axis-traction, Kelland, Barton, and Piper forceps, the last-mentioned designed for the after-coming head.

We find described the use of two types of straight forceps: the Elliott for the moulded head, and the Simpson for the unmoulded head.

For the most part, all the forceps are applied to the head in the position in which it is found, and then the head is rotated with the forceps into an occipito-anterior position before traction is applied; this is preferred to correction of the position and subsequent application of the forceps.

Manual rotation and digital rotation are described, but great stress is laid on the danger of pushing the head out of the pelvis during the manoeuvre. The author thinks that this should be the method commonly used, but that forceps rotation should be carried out when it is impossible.

The author considers that the obstetrician should kneel with his back to the patient before inserting the hand to perform a manual rotation. Suture lines and fontanelles are always used in the diagnosis of the position of the head, and palpation of the ear for this purpose is not mentioned.

Unfortunately most of the axis-traction forceps described will be unfamiliar in name to Australian readers.

Statistics quoted from the Polyclinic Hospital in New York are given; comparison with similar figures from an Australian hospital would be of interest. From 1941 to 1953 there were 9237 forceps operations and 4583 spontaneous births. In the former group there was a corrected mortality for monsters and macerated fetuses of 0·60% with a morbidity of 0·85%. In the latter group the corrected mortality was 1·15% and the morbidity 1·04%.

The student or graduate would find this book very helpful in the application of the more complicated types of forceps, and it could well be included in a medical school or hospital library.

Psychiatry for the Family Physician. By C. Knight Aldrich, M.D.; 1955. New York, Toronto and London: The Blakiston Division, McGraw-Hill Book Company, Incorporated. 9 $\frac{1}{2}$ " x 6", pp. 286, with 19 illustrations. Price: \$5.75.

In "Psychiatry for the Family Physician" Professor C. K. Aldrich has attempted the difficult task of bringing psychodynamics to the consulting room. Without sacrificing scientific accuracy, he has simplified psychiatric jargon to a point where the psychological mechanisms become understandable to the average medical practitioner. This is no mean achievement. For those whose mental processes need visual aids he has introduced helpful diagrams.

The underlying theme is the development of emotion in the individual and the part which it plays in the whole gamut of medicine from the impress of doctor to the impact of somatic disease or an interpersonal relationship such as marriage. Case histories are woven into the story. The author wisely limits their numbers, but often refers to them. The technique ensures a readable continuity.

The subject matter falls into three parts. The first deals with "The Emotions and Illness", the second with "Emotional Development". It ranges from the infancy and the training period to power politics within the family, intellectual deficits, adolescence, delinquency, neurotic reactions, psychotic reactions, marriage problems, the menopause, retirement and old age. The concluding part includes the "Diagnostic Process" and "The Physician's Role in Treatment".

The author emphasizes the importance of making a positive diagnosis of emotional factors rather than one based on the mere exclusion of a physical disease.

The role of the doctor calls for clear thinking. Nervous patients are often irritating and can easily provoke hostility in the doctor. It is necessary for the latter to face this possibility and take precaution.

We are warned that instruction to patients which has already been tried is frustrating. The doctor should before giving advice ask himself:

Is the solution obvious? If it is, do not advise. Can the patient follow the advice? If he cannot, do not advise.

Can he work out his own answers with the doctor's help? If he can, and it is possible to wait until he does, do not advise.

Often it is easy for the doctor to say too much, and ill-timed remarks can produce increased anxiety. Examples of these are given.

Professor Aldrich rightly believes that the general practitioner can carry out valuable psychological supportive therapy. The amount is governed by the time factor. This is dealt with in a practical manner. There is a similar common-sense approach to the giving of sedatives and placebos.

Not the least of the virtues of this book is the division into small chapters on special problems. For the busy practitioner and student seeing patients in the wards this has obvious advantages.

Whilst "Psychiatry for the Family Physician" is worth reading from cover to cover, its major sphere of utility may well be as a book of reference.

Virus and Rickettsial Diseases. By S. P. Bedson, M.D., D.Sc., F.R.C.P., F.R.S., A. W. Downie, D.Sc., M.D., F. G. MacCallum, B.Sc., M.D., and C. H. Stuart-Harris, M.D., F.R.C.P.; Second Edition; 1955. London: Edward Arnold (Publishers), Limited. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ", pp. 416, with 33 illustrations. Price: 30s.

The first edition of "Virus and Rickettsial Diseases" published in 1950, was described in these columns as fulfilling admirably its aim of providing the general medical reader with a coherent account, compact rather than exhaustive, of the virus and rickettsial diseases which attack man. A second edition has become necessary to keep abreast of rapidly expanding knowledge. Subjects that have been thoroughly revised or added include the nature of virus multiplication, chemotherapy, poliomyelitis, Murray Valley encephalitis, Coxsackie disease and cat scratch fever.

There is still no effective chemotherapy of human virus diseases, except for the psittacosis-lymphogranuloma group, which tend now to be classed with the rickettsioses. However, intensive study of substances which affect the relationship between virus and host cell may one day lead to findings of therapeutic value.

A flood of new information on poliomyelitis has followed the use, since 1949, of tissue culture methods for isolation of virus, detection of serum antibodies and preparation of vaccines, and this is systematically reviewed. The reader may study electron photomicrographs of the three types of the virus.

Concise, up-to-date accounts are given of the other virus diseases and the rickettsioses, and a useful appendix sets out the specific tests which are available in each disease and the material which should be submitted to the laboratory.

Materia Medica and Pharmacology for Nurses. By J. S. Peel, M.P.S., with a foreword by Flora Cameron, O.B.E., with Key to the Calculations, for the use of lecturers and tutor sisters only; 1955. Christchurch: N. M. Peryer, Limited. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ", pp. 176, with 14 illustrations. Price: 2s.

This text-book, published in New Zealand, has been written by Mr. J. S. Peel, who has interested himself particularly in hospital pharmacy and therefore has a wide experience in working with the nursing profession. To present the subject of *materia medica* in a concise volume of some one hundred and sixty pages is no mean achievement, and it is inevitable that some of the discussion must be brief and restricted.

The book is intended to cover two years of training in nursing, and the first four chapters deal with weights and measures, dosage calculations and the use of disinfectants and antiseptics. In this section clear examples are given which are typical of the problems likely to be encountered in nursing practice. A selection of useful problems is

included, also carefully chosen to be of practical value. The chapter dealing with prescription writing and forensic pharmacy gives a very concise and clear account of a very detailed subject.

The remaining chapters deal with groups of drugs classified, in the only logical manner, according to their actions on the body. In these twelve chapters the author discusses the accepted drugs in use today, giving a brief account of their pharmacology, uses and the doses usually employed. Drugs which are merely useless relicts of an earlier age are ruthlessly excluded—the only way to discourage their continued use. The discussion of the mode of action of the autonomic drugs seems to be rather sketchy, but as the book is intended to be used in conjunction with a course of lectures and instruction, this is of little importance; but to refer to the sympathetic and parasympathetic systems as adrenergic and cholinergic without further qualification seems to be perpetuating an anatomical distinction between these two which pharmacologists no longer recognize as paralleled physiologically.

The illustrations are well chosen, although their execution is not of high standard.

This book is well written indeed and should prove a valuable aid to nurses in training.

Breast Cancer and Its Diagnosis and Treatment. By Edward F. Lewison, B.S., M.D., F.A.C.S.; 1955. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 7". pp. 490, with 181 illustrations. Price: £8 5s.

THIS monumental and sumptuously produced work, emanating from Johns Hopkins Hospital in Baltimore, sets out to assemble the known facts in regard to breast cancer, and to draw deductions therefrom. It is a book that no surgeon or radiologist interested in breast cancer can afford to be without.

From the sifting of a vast material the opinions of the author can thus be summarized.

A woman of thirty-five years has a 5% to 6% chance of developing cancer of the breast during her life-time, the risks increasing with advancing age, and a 4% chance of dying of the disease. There is no predisposition to this neoplasm, except possibly in persons with chronic cystic mastitis, where some studies suggest a limited predisposition sufficient to warrant periodical reexamination of such breasts.

When every allowance is made for the variations in growth rate of breast cancers, and for the fact that a less invasive type treated comparatively late in the disease may have a better prognosis than many others treated much earlier, it is still true that the earlier the diagnosis is made and efficient treatment instituted, the better will be the ultimate result.

This statement could be false only if all growths, however early recognized, had already spread to areas beyond the reach of local treatment. This is amply disproved by the results of the surgical treatment of patients when no axillary metastases are found, in whom radical mastectomy gives a ten-year survival rate of up to 84%.

When metastatic axillary spread has occurred, the five-year survival rate drops to 30%, owing mainly to the blockage of the axillary lymphatic filter encouraging embolic spread through the internal mammary lymphatic chain, where the glands show invasion in 36% of such cases.

No variations in local treatment can much improve this situation, since most of the 70% who fail to survive five years must already have had wide dissemination prior to the initiation of any treatment. But the evidence of the frequency of anterior mediastinal gland metastases proves the standard radical mastectomy to be an inadequate local removal, and modifications of this operation are desirable. These may take the form of superradical mastectomy, the addition of post-operative irradiation to radical mastectomy, or the adoption of the McWhirter technique of conservative mastectomy, followed by intensive radiotherapy.

The long-term results of superradical mastectomy (in which the mediastinal glands are removed) cannot yet be assessed, but in expert hands it need carry no more than 1% mortality, without much increase in morbidity.

Although the McWhirter technique has shown in his hands an absolute survival rate of 42% for five years and 25% for ten years, this is not significantly better than that obtained in good surgical clinics which adopt radical mastectomy, followed by radiotherapy, and his case for the replacement of the radical operation is regarded as unproven.

It is imperative in this respect to realize that both surgery and irradiation are local treatments, capable only of local

effects. The primary purpose of adding radiotherapy to a surgical procedure is therefore to improve the chances of local eradication rather than to increase the total survival time.

For cancer limited to the breast post-operative irradiation is not recommended. In operable patients with axillary metastases it should be added in all cases to radical mastectomy, though its chief effect is probably seen in the more advanced axillary involvements.

When cancer of the breast proves to have disseminated widely, there is still a large field for appropriate treatment. In pre-menopausal women, temporary regression of distant metastases, and especially those in bone, can be achieved in 20% of cases by induction of an artificial menopause and the administration of androgens. When metastatic lesions are found in patients five years or more beyond the menopause, control can frequently be obtained (for six months or more), and sometimes repeated, by either oestrogen therapy or its cessation, or by androgen therapy.

But notwithstanding the benefits seen from hormonal therapy, X-ray therapy is still considerably more effective in the treatment of osteolytic lesions of the skeleton than are our present endocrine methods.

The author of this all-embracing book still has no doubts that in this depressing disease early diagnosis and meticulous radical surgery, supplemented sometimes by radiotherapy, is the only means by which any improvement on present results can be obtained.

A Manual of Psychiatry. By K. R. Stallworthy, M.B., Ch.B.; Third Edition; 1955. Christchurch: N. M. Peryer, Limited. 7½" x 5". pp. 334. Price: 30s.

STALLWORTHY'S book is more aptly described by the subtitle as "A Practical Guide for Practitioners and Students of Psychiatry". It is relatively small, and much unnecessary detail and controversial matter, often found in similar books, has been deleted. The approach is essentially descriptive.

The author can appreciate the student's difficulties and has gone to some trouble to convey the simple facts and routine practices relating to the understanding and treatment of the mentally ill patient. Occasionally statements are found that might be disputed, but some rigidity of expression seems necessary in elementary instruction.

Selections of subjects in such a book must always be difficult. Detailed information relating to the preparation of patients and methods of administering the special forms of treatment, such as electric shock treatment, insulin coma, leucotomy, and the malarial treatment of general paralysis of the insane, is not likely to be of much interest to many practitioners outside mental hospital practice. Of much wider appeal would be a chapter on the behaviour disturbances in childhood, and some general direction about handling the interpersonal relationships in the home.

The book is particularly lucid when the author is describing the psychoses.

An unusual inclusion is a useful chapter on certification, with particular reference to New Zealand and the various States of Australia, except Queensland.

Although one may find matters to criticize, the overall impression is that of a most useful book, simple in expression, short, and essentially practical.

Notes on Books, Current Journals and New Appliances.

The Pin Index Safety System

A FURTHER advance in safety in the use of medical gases will be introduced in Australia early next year when the Pin Index Safety System of non-interchangeable valves for gas cylinders and anaesthetic apparatus is adopted.

This system, which has already been introduced in America and has been accepted by the British Standards Association, is very similar to that used with radio valves, whereby spacing of the pins ensures that each type can be inserted only in the corresponding socket. Applied to gas cylinders, it prevents a wrong cylinder of gas being connected to the administration apparatus.

Proposals to prevent this occurrence have been under consideration for some time. Following recommendations by an Australian subcommittee set up to investigate safety in hospitals, the Standards Association of Australia has

adopted the Pin Index Safety System and has covered it with supplement No. 1 to CB4-1950. The system has also been recommended by the International Standards Organization as a world standard.

The system consists of a combination (peculiar to each gas or gas mixture) of two pins, which project from the apparatus yoke assembly. Appropriately matching holes are provided in the cylinder valves to prevent attachment to any but the correct combination (Figure I).

Holes—or pins—in six positions allow the combinations as indicated in Figure II. All vital dimensions have been carefully "toleranced" to prevent a drift which could prevent international uniformity.

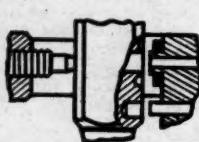


FIG 1

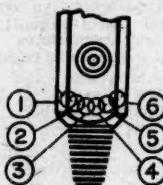


FIG 2



FIG 3

Adaptors will be available to allow ready conversion to pin index of the more common existing apparatuses in this country (Figure III). Conversion of the minority and sundry apparatus must be subject to individual consideration.

When the system is fully operating, it will be possible to attach only drilled valves to pin indexed apparatus, but drilled cylinder valves will fit apparatuses not adapted to pin index.

April 2, 1956, has been set for the introduction of pin index throughout Australia. New apparatus after this date will be pin indexed. All cylinders supplied throughout Australia after this date will be fitted with drilled valves, and it is vital that all cylinders with undrilled valves be used quickly and returned before this date.

World Distribution of Spirochetal Diseases: 2. Relapsing Fevers, Louse-borne and Tick-borne: Basic Sources, by the Department of Medical Geography, American Geographical Society; 1955. New York: American Geographical Society. 38" x 25". Price: \$1.50 flat.

PLATE 16 of the American Geographical Society's Atlas of Diseases shows the distribution of louse-borne and tick-borne relapsing fevers throughout the world. Besides the areas of endemicity are shown places where individual cases have been reported, and the type and extent of recorded epidemics, as well as the foci of greater endemicity. A good basic bibliography is included, printed upon the back of the sheet.

Principles of Medical Statistics, by A. Bradford Hill, C.B.E., D.Sc., Ph.D., F.R.S.; Sixth Edition; 1955. London: The Lancet, Limited. 8½" x 5", pp. 32. Price: 10s. 6d.

"THE LANCET", in 1937, collected in book form the series of articles on medical statistics contributed by A. Bradford Hill. The sixth edition has now appeared, with a new chapter in which the special problems of clinical trials are dealt with, and 16 pages of random sampling numbers have been added. Nobody can afford to ignore the principles of statistical expression and evaluation when publishing results of work or assessing results published by others, and this book covers all aspects of the subject adequately and in detail, while remaining intelligible to those not specially trained in statistical methods.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Obstetrical Practice", by Alfred C. Beck, M.D., and Alexander H. Rosenthal, M.D.; Sixth Edition; 1955. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 7", pp. 1080, with many illustrations. Price: £6 12s.

The first edition was published in 1935 and the fifth in 1951.

"The Year Book of Pediatrics (1955-1956 Series)", edited by Sydney S. Gellis, M.D., 1955. Chicago: The Year Book Publishers, Incorporated. 7" x 5", pp. 431, with illustrations.

One of the Practical Medicine Series of Year Books.

"The Psychiatric Interview", by Harry Stack Sullivan, M.D. Edited by Helen Swick Perry and Mary Ladd Gavel, with an introduction by Otto Allen Will, M.D.; 1955. London: Tavistock Publications, Limited. 8" x 5½", pp. 269. Price: 2s.

This book has been prepared under the auspices of the William Alanson White Psychiatric Foundation Committee on Publication of Sullivan's Writings.

"Conceptions of Modern Psychiatry: The First William Alanson White Memorial Lectures", by Harry Stack Sullivan, M.D., with a foreword by the author and a critical appraisal of the theory by Patrick Mullaly; 1955. London: Tavistock Publications, Limited. 8" x 5½", pp. 311. Price: 32s. 6d.

This is the first time that this material has appeared in book form, but the fifth time that it has been reprinted.

"Peripheral Vascular Disease", by A. J. Barnett, M.D., M.R.C.P. (London), M.R.A.C.P., and J. R. E. Fraser, M.D., M.R.A.C.P.; 1955. Melbourne: University Press. 8½" x 5½", pp. 233, with many illustrations. Price: £2 17s. 6d.

The book is substantially identical with the Stawell Memorial Prize Essay of 1952.

"The Sequela of Amputation", by Keith C. Bradley, F.R.A.C.S.; 1955. Published by the Trustees of the Services Canteens Trust Fund (Australia). 8½" x 5½", pp. 243. Price: 10s.

The result of research extending over a period of three years.

"The Biliary Tract: With Special Reference to the Common Bile Duct", by Julian A. Sterling, A.B., M.D., M.Med.Sc., Sc.D., F.A.C.S.; 1955. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 433, with many illustrations. Price: £5 10s.

An attempt to correlate clinical features, laboratory investigations, operative procedure and biliary tract functions for the benefit of the gastro-enterologist, the general practitioner, the surgeon and the investigator.

"Cybernetics: Circular Causal and Feedback Mechanisms in Biological and Social Systems. Transactions of the Tenth Conference, April 22, 23 and 24, 1955, Princeton", edited by Heinz Von Foerster; 1955. New York: The Josiah Macy, Jr. Foundation. 9" x 6", pp. 100.

The three main subjects dealt with were: Studies on the activity of the brain, semantic information and its measures, meaning in language and how it is acquired.

"Taylor's Principles and Practice of Medical Jurisprudence", edited by Sir Sydney Smith, C.B.E., LL.D., M.D. (Edin.), Hon. M.D. (Louvain), D.P.H., F.R.S. (Edin.), assisted by Keith Simpson, M.D., Lond. (Path.), the legal aspect revised by Gerald Howard, Q.C., M.P., psychiatry and the law contributed by David Stafford-Clark, M.D., M.R.C.P., D.P.M., the chemical aspect revised by L. C. Nickolls, M.Sc., A.R.C.S., F.R.I.C.; Eleventh Edition, Volume I; 1956. London: J. and A. Churchill, Limited. 9½" x 6", pp. 633, with illustrations. Price: £3 10s.

This edition is a "radical revision" of the tenth edition.

The Medical Journal of Australia

SATURDAY, APRIL 7, 1956.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author; year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

HEROIN.

THE banning of the manufacture of heroin was discussed at the meeting of the Federal Council of the British Medical Association in Australia held at Hobart in February last. It will be remembered that the proposal to prohibit the manufacture of heroin was first brought to the attention of the Federal Council early in the 1930's, when the late J. H. L. Cumpston was Director-General of Health; it was thought that the manufacture of the drug should be banned, but nothing came of the discussions. Later, in 1952, the present Director-General laid before the Federal Council recommendations by the World Medical Association that the banning should be international. The Federal Council decided that there should be no curtailment of the availability of heroin to the medical profession of Australia. Later on the Director-General wrote again urging the Federal Council to give careful and sympathetic consideration to the proposal that the use of heroin in Australia should be prohibited. The matter was again referred to the Branches (see THE MEDICAL JOURNAL OF AUSTRALIA, April 18, 1953), with the result that all the Branches except Queensland agreed to forgo the use of heroin. It was pointed out at that time that a special committee had investigated the proposal for the New South Wales Branch, and that the committee had reported that while heroin was still the best substitute for morphine in cases in which morphine produced vomiting and other distressing side effects, nevertheless it was realized that a number of the newer preparations, and in particular "Dilaudid" and pethidine, acted as reasonable substitutes. The Federal Council then resolved to support the Government's proposal. This was the position until February last, when the Federal Council received a letter from Sir Darcy Cowan, of the South Australian Branch, who wished to have the ban lifted. As we shall see

presently he was not alone in expressing this view. Sir Darcy Cowan referred the Federal Council to a letter which he had written to the South Australian Branch Council. This letter was as follows:

163 North Terrace,
Adelaide,
5th January, 1956.

Hon. Medical Secretary,
S.A. Branch of the B.M.A.,
North Adelaide.

Dear Sir,

The banning of the use of any valuable drug is a very serious matter and should not be lightly undertaken. This applies to heroin which for many years has been accepted as the best substitute for morphine. Heroin is to be banned, or has been banned, on the main ground that it is likely to lead to addiction.

We are told that pethidine is an effective substitute. Now there is alarm over the risk of pethidine addiction. I refer you to the Branch Notice of 22/8/55 in which attention is called to the dangers of prescribing pethidine.

The W.H.O. was instrumental in the banning of heroin. Now it is worried about pethidine. Something seems to have gone wrong with the W.H.O. experts. I suggest that it is time we ceased to follow their lead.

I wish to draw your attention to certain facts. At its Meeting on 21/8/52 the Federal Council, at the request of the Commonwealth Director General of Health, discussed the use of heroin at some length as reported in the M.J.A. of 27/9/52. It concluded with the words: "There should be no curtailment of the availability of heroin to the medical profession."

But the Commonwealth persisted in its efforts to get the Federal Council to agree to the banning of heroin. At the Meeting of the Federal Council held on 23rd February, 1953, the General Secretary reported that he had received a further communication from the Director General of Health asking that the Federal Council should give careful and sympathetic consideration to the proposal that the use of heroin in Australia should be prohibited. The Secretary General said that he had again referred the matter to the Branches and that, with the exception of Queensland, they had agreed to forgo the use of heroin.

The Federal Council then resolved to support the Government's proposals that the use of heroin in Australia should be prohibited. Though this constituted a *vote face* on the part of the Federal Council, it could hardly be blamed in view of the advice received from all but one of its Branches.

The responsibility then for supporting the proposal rests squarely on the Branches including the S.A. Branch. The N.S.W. Branch appointed a special committee to investigate the matter. The committee reported that while heroin was still the best substitute for morphine in cases in which morphine produced vomiting and other distressing side effects, nevertheless it was realised that a number of the newer preparations, and in particular "Dilaudid" and pethidine, acted as reasonable substitutes. Under those circumstances and as there appeared cogent reasons for the withdrawal of heroin from practice, the committee felt that such a move should not be opposed.

What the cogent reasons were, the committee did not say. They appeared to be political rather than medical. It is interesting also to note the present alarm over pethidine.

I am sorry, but I am afraid that this involves the S.A. Branch Council of 1952/3 rather deeply. It appears that this matter was referred to it twice by the Federal Council. At its Meeting on 4/12/52 the Branch Council resolved: "That the Council re-iterates the opinion previously expressed at a Meeting of the Council held on 2/7/52 as follows: 'That the Federal Council be advised that the Council of the S.A. Branch is of opinion that the use of heroin should be banned in Australia in the interests of world health generally.'"

I take particular exception to the fact that this opinion was expressed by the Branch Council without any reference to members of the Branch, and without the matter even being mentioned in the Annual Report. The members of the Branch have had no opportunity whatever to discuss or give an opinion on a matter which concerns every one of them. My own view is that the ban is unwarranted and absurd. It has been

virtually forced upon us by political action, and I feel it should be vigorously resisted, even if this means reversing a policy adopted by a previous Council.

It is clear that the Federal Council originally did not approve the ban; it changed its ground only when Branch Councils advised that they did not oppose it. And as far as I can see, Branch Councils did not seek the opinions of their members generally. The ban in fact was approved by about 100 Council members; some six thousand or more ordinary members were left with no voice at all. I look upon this as a very serious matter.

Heroin was declared a prohibited import in March, 1953. Sufficient time has elapsed to show the futility of the ban. I would refer you to a letter in the *B.M.J.* of 19th November, 1955, p. 1267. This speaks for itself. I believe that almost the same position obtains here, only that it is worse in that the ban has actually been adopted.

But all is not yet lost. The Federal Minister for Health has said that if the Federal Council of the B.M.A. believed that the ban should be lifted or modified, the Government would seriously consider doing so. I suggest that it is incumbent on your Council to seek the opinions of the members of the Branch. This could easily be done by issuing to each member, with the monthly circular, a simple *questionnaire* such as:

- i. Are you in favour of a complete ban on the use of heroin in Australia?
- ii. How many cases of heroin addiction have you seen in the past ten years?

When the replies are received and collated, your Council would be in a position to further advise the Federal Council.

I am,

Yours truly,
(Sgd.) D. R. W. COWAN.

The Federal Council was aware that a great deal of discussion had taken place in England on the reversal of the ban. After discussion, in which the different points of view were mentioned, the Federal Council resolved to refer the matter to the Branches. Whether the Branch Councils will deal with it or whether they will refer it to their individual members remains to be seen.

In order that readers of this journal shall have a clear understanding of the questions involved it has seemed advisable to give a short account of what has happened in England and to set out the different points of view. First of all, let us remember that Great Britain manufactures more than 70% of the world's heroin. The British Minister of Health made this statement in the House of Commons and Mr. L. Atzenwiler, Secretary of the Opium Board, is reported from Geneva in *The Times* as having confirmed this statement on December 7, 1955. He added that in 1952 the output from Britain was 73%, in 1953 it was 69% and in 1954 it was 91%. The reason for the sharp rise in 1954 was that some countries, in particular France and Belgium, had temporarily suspended manufacture. "The possibility of dispensing with the use of heroin was considered in Britain as long ago as 1950, when, as quoted in *The Times* of December 2, 1955, "the Minister of Health and the Secretary of State for Scotland were advised that it would be justifiable to prohibit the use of heroin in Britain if international agreement were reached to prohibit the manufacture of heroin". The Minister of Health consulted the Standing Medical Advisory Committee as being "the most suitable body to consult". The Council of the British Medical Association is represented on this committee. On February 18, 1955, the Home Secretary announced in the House of Commons his decision not to grant further licences for the manufacture of heroin after December 31, 1955, except in respect of small quantities needed for scientific purposes or for

the manufacture of nalorphine. The Home Secretary in his statement (*The Times*, December 2, 1955) added that on July 11 with the Minister of Health and the Joint Parliamentary Under-Secretary of State for Scotland he had received a deputation from the British Medical Association and discussed the matter very fully. After consultation with his colleagues, he adhered to the advice originally tendered to him by them, and decided to maintain his decision not to permit the general manufacture of heroin after the end of the year. He informed the British Medical Association of this decision on October 17. The British Medical Association had been active in regard to the ban before this. Dr. E. A. Gregg told the Annual Representative Meeting of the Association in June that he had to admit that in the discussions of the Medical Advisory Committee the dreadful picture of heroin addiction made such an impression that the committee did not feel that the sacrifice which might be involved in not having it at disposal was very small compared with the advantage that would come from heroin not being available. This is, of course, what our own Federal Council felt when it agreed to fall in with the suggestion of the Director-General of Health. The Annual Representative Meeting last June adopted a resolution protesting against the threatened ban and recommended that heroin should still be made in Britain for use by medical practitioners, but not exported. The deputation to the Home Secretary and his colleagues putting forward the Association's views has been mentioned. Correspondence in *The Times* has been undertaken by many influential people. On November 30, 1955, a letter was published signed by W. Russell Brain, David Campbell, Arthur W. Gemmell, William Gilliat and Henry Platt, who pointed out that the Advisory Committee had reached the view that heroin was not indispensable after considering with the greatest care every argument which had been repeated recently. They pointed out, however, that some doctors wished to prescribe heroin and that this raised the question whether the Government was right to ban it as long as this was so. They thought that the decision involved a choice of social values which could be made not by doctors alone, but only by the Government. To this Angus Macrae, Secretary of the British Medical Association, replied, *inter alia*: ". . . before we apply our minds to any choice of social values do we not need to discover a little more about the medical value of heroin—a little more about the magnitude of any 'extra suffering' that would inevitably result from the banning of the drug?" In *The Times* of December 1, 1955, Sir Cecil Wakeley wrote that to impose the ban was "both foolish and immoral". Among the reasons which he gave for this statement was the fact that Dr. Herbert Berger, President of the Medical Society of New York, had said at a recent International Congress of Criminology that it would be a fatal error if Britain were to follow the example of the United States where there was a strong move in both medical and political circles to have the ban lifted. Sir Reginald Watson-Jones thought that the proposed ban was rather stupid, and one of the reasons which he gave was that it was so easy to convert morphine into heroin, even in the back kitchen, that if heroin was banned morphine ought to be banned also. Sir Stanford Cade wrote in favour of the ban. He gave as his experience that patients who were said to respond solely to heroin were influenced by the euphoric effects of

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the drug and that this was why they disliked substitutes. To this, one G. K. Cooper replied that Sir Stanford Cade had touched the spot when he referred to the production of euphoria in addition to heroin's pain-relieving properties. He asked, we think quite rightly: "Why deny this to those dying of cancer?" *The Times* itself took a hand on December 1, 1955, when it referred to a "choice of social values". On one side it placed the fight against heroin addiction, "an evil of microscopic proportions in Britain", and a fight likely to be unsuccessful owing to the ease with which heroin could illicitly be made. On the other it placed law-abiding, stricken, suffering men and women. There was no doubt on which side the decision should rest—the law-abiding, the stricken and the suffering should not be denied the alleviation which in the opinion of so many doctors could be given in no other way. The leading article concluded with a statement which is the most important so far recorded:

There is, moreover, a further question of principle involved. Has the State ever before interfered between doctor and patient by prohibiting an established drug which his professional judgment may deem it essential he should use? In some ways this is the most vital issue of all.

We have nearly come to the end of the story. The British Medical Association issued a statement and circulated it among members of both Houses of Parliament. In this document the above statement from the leading article of *The Times* was quoted. In *The Times* of December 14, 1955, there appears a long account of a debate in the House of Lords. Lord Salisbury announced that licences for the manufacture of heroin would be issued for 1956. As *The Times* puts it: "This concession was wrested from the Government by Lord Jowitt, who had startled the House with the suggestion that there were serious grounds to doubt whether the Home Secretary had any right to use his powers under the *Dangerous Drugs Act*, 1951, to impose the ban, and whether, in fact, what had been done had been done legally." The leading article in the same issue of *The Times* remarked that Lord Jowitt had found a way of escape for the Government from the grievous mistake they seemed bent on committing. It added: "So common sense and humanity have come in, temporarily at any rate, by a side door." With this British drama before them, the Branches of the Association in Australia will be likely to follow the example set them, especially if individual members, as Sir Darcy Cowan suggests, have any voice in the decision.

Current Comment.

GASTRIC ULCER AND CONTINUOUS INTRAGASTRIC MILK DRIP THERAPY.

In 1932 A. Winkelstein¹ described a new treatment for peptic ulcer. It consisted of "a continuous, twenty-four-hour daily, Murphy drip, through a Rehfuss tube, of alkalinized milk into the stomach in duodenal ulcer, in gastric ulcer, and in jejunal ulcer". Subsequently an account of ten years' experience with the therapy was published by Winkelstein in conjunction with A. Cornell and F. Hollander,² the method having then been extended

to include the use of gels of aluminium hydroxide and phosphate as alternatives to the milk-sodium bicarbonate preparation originally used. The report was of a general character, and it did not set out to provide details of the hundreds of patients who had been treated by means of the drip therapy. However, it is clear that many of the patients had particularly severe and sometimes intractable ulcers, and the statement was made in the paper that in most cases drip therapy was not begun until all other measures of treatment in bed had failed. This was especially true of patients with nocturnal distress, to whom only the drip therapy gave relief. Others were, for various reasons, unfit to undergo surgery. In those instances, it was stated, as well as in those in which the patients had intractable pain day or night unrelieved by the usual methods of therapy, the drip treatment was of great value. "The rapid and often complete disappearance of jejunal, gastric and esophageal ulcers, as evidenced by X-ray examination and gastroscopy, has given striking proof of the value of continuous neutralization of the intragastric acidity by the drip method." Expressing themselves as being in harmony with those who are inclined to be sceptical of any new ulcer therapy, Winkelstein and his colleagues stated that it might be expected that the proponents of a new ulcer therapy should demonstrate, first, that it was rational, second, that it was practical, and third, that it produced prompt and more persistent results than any other forms of therapy. They believed after ten years of experience that the drip therapy with milk and sodium bicarbonate or with aluminium gels satisfied those criteria. It is to be noted, however, that they made no mention of any control observations.

Another report favourable to the continuous drip treatment was that of A. M. Clark,³ who reported his experience in the treatment of 35 patients at the Ministry of Pensions Hospital in Worcester. He agreed that theoretically milk was the ideal fluid to be used, but for various topical reasons a substitute had to be found, and it appeared that a solution of magnesium bicarbonate with added tincture of opium was the best substitute. Relief was described as being equally remarkable with both milk and the magnesium bicarbonate solution. The most notable feature was the almost instantaneous relief of abdominal pain, and in every case, no matter how severe the pain, relief was obtained within thirty-six hours of the start of the drip administration. A much more cheerful outlook was engendered in the patients, and this, coupled with the improved general condition, was found to be an asset in preparing patients for surgical treatment. Of the 35 patients, 33 were examined radiologically before the drip administration was begun; in 29 an ulcer was demonstrated; the diagnosis in the other cases was made on clinical grounds. Of the 29 patients in whom an ulcer was seen radiologically before treatment, 19 showed no radiographic evidence of an ulcer one to sixteen weeks after the drip therapy had ended. A further five patients examined up to two weeks after the drip therapy had ended had either a small residual ulcer or a healing ulcer. In the remaining seven cases there was evidence of the presence of an active ulcer, and in most cases surgery was advised; in all but one (in which a gastric carcinoma was found) a large chronic ulcer with multiple adhesions was revealed at operation. The only clinical disadvantage of the treatment appeared to be the tendency to diarrhoea caused by the magnesium bicarbonate drip therapy. Clark described the treatment as a satisfactory method for the medical treatment of acute and subacute peptic ulcer under present-day conditions, especially when there was considerable pain associated with gastric and pyloric spasm. He said that it required the least attention from the nursing staff and thus enabled a small staff to care for more patients. The constant drip administration kept the gastric contents neutral throughout the twenty-four hours more effectively than intermittent feeding methods and afforded the stomach maximum rest. The method was suitable for the treatment of recent haematemesis and where the general condition was poor or the patient needed building up for operation.

¹ Am. J. Surg., March, 1932.

² J.A.M.A., November 7, 1942.

³ Lancet, March 11, 1950.

An Australian experience with the treatment was that of H. W. Garlick,¹ of the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital. Garlick described the technique in full, but apart from two reports of cases supplied no details of the results. He made the general statement that continuous intragastric drip therapy had been used for many years in the treatment of peptic ulcer, but it should be used more often than it was. Its use was advocated when pain was not relieved by a routine ulcer regime and in the pre-operative treatment of pyloric stenosis. Again the report is general in character, and, as in the series reported by Winkelstein *et al.*² and by Clark, no control observations appear to have been made. This is unfortunate, as there seems to be little doubt that the treatment relieved pain.

More helpful in assessing the real value of this form of treatment are two recent reports from England.³ The first is a controlled trial carried out in two hospitals by R. Doll, A. V. Price, F. Pygott and P. H. Sanderson. The series consisted of 164 patients suffering from uncomplicated gastric ulcer; 82 received the drip treatment, and 82 who were otherwise treated in the same way did not receive it. In 40 cases the drip solution consisted of six pints of milk a day with no added alkali; in 40, sodium bicarbonate in an amount of 40 grammes was added to each six pints of milk; in two the dose was increased to 80 and 140 grammes respectively. The results of treatment were assessed by recording the change in size of the radiographic ulcer niche, the change in the patient's weight, and the duration of the patient's symptoms. It was found that the proportion of ulcers which healed in the course of a month was identical in the two treatment groups, being in both cases 20 out of 82; and the average extent to which healing took place, expressed as a percentage of the initial size of the ulcer, was also similar. The impression was received that pain was relieved more rapidly with milk drip therapy than without it, and an alkalized milk drip administration is considered a useful adjunct to the standard treatment of patients whose pain persists after rest in bed. It was found also that patients given milk drip therapy gained, on the average, more weight than patients not given the therapy, and a slight advantage was still preserved two to three months after their discharge from hospital. These investigators describe as disappointing the failure to demonstrate a beneficial effect on the healing of gastric ulcers by the continuous intragastric milk drip method. Even the addition of alkali in the milk in sufficient quantity to keep the acidity of the gastric contents in the majority of cases above pH 4.0 throughout the twenty-four hours failed to have a recognizable influence on the healing process. It is conceded that the continuity of the drip may not have been maintained with the same exacting attention to detail under conditions of routine treatment as in the course of some experimental observations that have been made, but this does not affect the validity of the results as they apply to ordinary clinical use. The results appear to suggest that unless very short periods of exposure are effective, peptic digestion cannot be of prime importance in maintaining the activity of a gastric ulcer. The corollary to this is that under conditions of bed rest in hospital further treatment aimed at the complete elimination of peptic digestion is unlikely to help the ulcer to heal. This does not, of course, diminish the value of the treatment in selected cases from the point of view of relieving pain, and the rapid gain in weight also has its value in certain circumstances. It is pointed out that the data obtained from this investigation throw no light on the value of milk drip therapy for duodenal ulcer. Acid secretion is usually increased in quantity in patients with a duodenal ulcer, but it is usually close to normal in patients with a gastric ulcer. It is therefore considered possible that peptic digestion may play a more important role in the production or maintenance of the activity of duodenal ulcers, and conclusions drawn from the treatment of patients with a gastric ulcer cannot be applied automatically to the treatment of patients with a duodenal ulcer.

The other paper which appears in the same issue of *The Lancet* deals in particular with haemorrhage as a complication of peptic ulcer. In this A. M. Dawson reports a comparative study involving 100 patients suffering from haemorrhage from the upper part of the gastro-intestinal tract. In all cases a Ryle's tube was passed to between marks II and III. Alternate patients were treated with continuous intragastric milk drip administration of six pints of non-citrated milk each twenty-four hours; so that 50 received this treatment, and 50 did not. Otherwise the patients were treated routinely with a purée diet, alkalis for symptomatic relief of pain, sedation, blood replacement and emergency operation if necessary. The two groups were found to be well matched for age and cause of bleeding. Subsequent observation indicated that the two groups did not differ in the incidence of massive further hemorrhage. This is, of course, in line with the conclusion of Doll, Price, Pygott and Sanderson that the drip therapy does not hasten the healing process and suggests that the relief of pain obtained with this therapy should not be allowed to encourage false confidence. Incidentally, Dawson's experience also failed to support the view that an indwelling Ryle's tube is of value in giving warning of impending massive haemorrhage. His impression was that massive bleeding usually occurred suddenly.

RADIOLOGICAL FINDINGS IN REGIONAL ENTERITIS.

LITTLE is understood of the true nature of regional enteritis, a chronic condition of the small bowel also known as Crohn's disease or terminal ileitis. Various views have been expressed as to the cause, from low-grade infection of the lymphatic system to a local allergic process. Confusion has existed with tuberculous lesions of the bowel and with malignant tumours. Diagnosis may be possible on the evidence of the history or of the clinical findings. Laparotomy may yield a satisfactory diagnosis, but is probably unjustifiable unless surgical correction of the bowel is contemplated at the same operation. The most useful aid, both to the diagnosis and in the estimation of the extent of the disease, is a careful radiological examination. The findings which may be expected in this disease have been described by R. H. Marshak and B. S. Wolf,⁴ who define regional enteritis as a non-specific granulomatous, ulcerative, necrotizing, inflammatory disease of unknown aetiology. Internal fistulae from the ileum to the adjacent viscera, external fistulae to the abdominal wall and perirectal spaces are frequent. The intestine is thickened, rigid, and hose-like with a blotchy red discolouration on its serosal aspect. In most cases the granulomatous process stops abruptly at the ileo-caecal valve. However, extension as far as the descending colon has been reported. The mesentery of the involved portion of small intestine is hugely thickened, soggy and oedematous, and contains enlarged lymph nodes. Skip areas of normal bowel in varying lengths are characteristic. Matting of various intestinal loops to each other and to other structures, secondary to abscess formation of fistule, may be noted. Proximal and distal extension of the disease process, despite repeated radiological examinations extending over a period of many years, has not been observed. The maximum length of involvement is determined by the initial radiological studies. This is not true for the frequent recurrence of the condition after exclusion operations.

One of the prominent features of this disease is the development of stenosis with obstruction. Therefore, roentgenologically, the cases may be divided conveniently into stenotic and non-stenotic groups. It is impossible to classify these groups as either early or late, since the majority of cases may continue without stenosis for many years. Again, division into active and inactive seems inappropriate, as the patient with long segments of stenotic intestine may also exhibit considerable evidence

¹ M. J. AUSTRALIA, September 24, 1949.

² Lancet, January 14, 1956.

³ Am. J. Roentgenol., December, 1955.

of clinical activity, manifested by fever, diarrhoea and abdominal pain. Early radiological changes are blunting, flattening, thickening and straightening of the *valvulae conniventes*. The folds are arranged in a fairly regular, symmetrical, parallel fashion, appear to be rigid and are perpendicular to the long axis of the intestine. The folds become thicker, irregular and partially fused. The lumen and contour become irregular. When ulceration occurs, a more characteristic pattern is produced. Longitudinal streaks of barium recognizable as ulcerations appear. As the thick, blunted folds of mucosa are further destroyed, "cobble-stoning" may be noted. This specific pattern is more common in the jejunum, probably because of the thicker *valvulae* in this region. Ulceration continues at the expense of the intervening islands of mucosa, the cobble-stones pattern being replaced by an irregular network of interlacing streaks of barium. The appearance at this stage has no uniformity or symmetry and is hazy and reticulated. Denudation of the mucosa is usually incomplete, and leaves behind islands of inflamed mucosa which produce multiple smooth defects of varying size. Their prominence is increased by the narrowing of the bowel lumen, due to early cicatricial contraction which commences at this stage. Finally, one may see the radiological image of a uniform, rigid, cast-like tube filled with barium and presenting no mucous membrane pattern. This appearance is similar to that of ulcerative colitis and represents the stage when scarring and regeneration of an atrophic mucosa are progressing. As scarring proceeds, the transition to the stenotic phase occurs. Not infrequently, the loops of intestine appear to surround a mass. Although this may be due to an abscess resulting from perforation, more often it is secondary to the induration of the mesentery, associated with the marked increase in the mesenteric fat and the enlarged lymph nodes. Skip areas, that is, segments of normal intestine intervening between diseased segments, represent another characteristic feature. The length of a skip area may vary from a few inches to several feet. The extent of involvement, as revealed by a röntgenogram, may be quite accurately determined in most cases, since the transition from the diseased to the normal intestine is fairly abrupt. In the stenotic stage, many of the rigid loops described previously become constricted to a remarkable degree. These stenotic segments resemble rigid pipe stems. This appearance is due to a marked thickening and contraction of the wall of the small intestine. The stenosis may extend through one or two centimetres, or over long segments. With severe narrowing, dilatation of the proximal part of the intestine may be pronounced. In many instances, it is difficult to state whether or not intrinsic disease is present in a dilated area. Very often disease is present when a loop of dilated intestine exists between two points of constriction. On the other hand, when there is a single area of constriction with proximal dilatation, disease may not be present in the dilated segment. However, because of retained secretions, secondary inflammatory changes, tension ulcers and muscular hypertrophy, the appearance of the dilated loops may be confused with the alterations seen in regional enteritis. This distinction is of great importance when one is considering surgical therapy. Many patients have not undergone operative intervention because the surgeon was of the opinion that the entire intestine was involved. Extreme dilatation of the intestine for long segments is rarely associated with intrinsic granulomatous disease.

"THE BRITISH JOURNAL OF TUBERCULOSIS AND DISEASES OF THE CHEST": GOLDEN JUBILEE.

The *British Journal of Tuberculosis and Diseases of the Chest* has published a Golden Jubilee Number. It is a handsome production and worthy of the occasion. The greater part of the issue is devoted to a series of articles on tuberculosis and its manifestations during the last fifty years. Antituberculosis work in many different centres is covered. The foreword is by Sir John Charles, Chief Medical Officer of the Ministry of Health. He states that

the role of the medical journal today is probably more important than it has ever been. "It is the proud and arduous function of the medical Press, however broad or restricted an outlook it has assumed, to comment, to correlate, to synthesize and above all to interpret 'all this new science that men learn'." An editorial entitled "Tuberculosis and Diseases of the Chest, Fifty Years on—1906-1956: Then and Now" traces the history of the journal. Its founder editor was Dr. T. M. Kelynack, described as a great pioneer in the sphere of tuberculosis. After nearly a quarter of a century he was succeeded by Dr. L. S. T. Burrell. Burrell was succeeded by Dr. Clifford Hoyle. The present editor is Dr. Philip Ellman. Sir Arthur S. MacNulty writes on fifty years of tuberculosis administration; Sir William Savage writes on fifty years of progress in tuberculosis control and Sir Robert A. Young on the clinical aspects of tuberculosis and diseases of the chest from 1906 to 1956. Dr. Charles Cameron writes on "The Changes of the Years" in Scotland. Dr. Hugh E. Burke gives an account of Canada's efforts to prevent and control tuberculosis. Dr. Cotter Harvey writes on tuberculosis and chest diseases in Australia; Dr. B. A. Dormer writes on tuberculosis in South Africa and Dr. R. F. Wilson sends some notes from New Zealand. Sir Clement Price Thomas contributes an article entitled "Fifty Years of Progress in Thoracic Surgery". Dr. T. Holmes Sellors writes on fifty years of surgery of the heart and circulation. Dr. Clifford Hoyle contributes an interesting article entitled "From the Editorial Chair", and in it he covers the period 1937 to 1950. Dr. Maurice Davidson has what is entitled an epilogue; it deals with retrospect and anticipation. This Golden Jubilee Number is really a contribution to the history of tuberculosis, and will be welcomed as such. The journal is published by Baillière, Tindall and Cox, of London, and the editor has an editorial board of twelve members from different parts of Great Britain and other Commonwealth countries. Dr. Cotter Harvey is the representative from Australia.

AN HONOUR FOR DR. JOHN G. HUNTER.

The Federal Council of the British Medical Association in Australia at its meeting at Hobart in February, 1956, decided to award the Gold Medal of the Association to Dr. John G. Hunter in appreciation of the signal services he had rendered to the medical profession over a period of many years. This honour is the highest that the Association in Australia can bestow on any of its members. The award was established by resolution of the Federal Committee in the year 1922. The first medal was awarded to the late William Thornborough Hayward, the first chairman of the Federal Committee. Subsequent recipients have been Robert Henry Todd, William Henry Crago, Henry Crawford Mollison, A. Graham Butler and Sir Henry Simpson Newland. The name of John G. Hunter will go down in the annals of Australian medical history in the company of these stalwarts of the medical profession. At the meeting of the Federal Council in February the President, Dr. H. C. Colville, enumerated Dr. Hunter's attainments and his services to the profession. It is to be noted that the terms of the original Federal Committee resolution are that the award shall be given "to a member of the British Medical Association who has rendered signal service to the profession". No one will deny that Dr. Hunter's activities during the fight for freedom against the Chifley Government were largely instrumental in the happy outcome of that conflict. The energy which he displayed in every part of the Commonwealth, his ability to clarify an obscure position by a happy choice of words and the incisive form of his diction will not be forgotten by those who were privileged to take part in the same enterprise. But this has been only one of Hunter's many services to the whole profession of Australia. This is not the occasion for rejoicing and for congratulation that merit has been appreciated and, as far as it is possible, rewarded.

Abstracts from Medical Literature.

RADIOLOGY.

Inflammatory Lesions of the Esophagus and Stomach.

F. J. HODGES AND P. RUBIN (*Am. J. Roentgenol.*, December, 1955) state that if one excludes the ordinary expressions of peptic ulceration, inflammatory lesions of the oesophagus and stomach are infrequently encountered during the course of röntgenological examination of the upper part of the gastro-intestinal tract. In sharp contrast, oesophagoscopic and gastroscopic examinations appear to yield numerous evidences of abnormality involving the mucosal surfaces of these organs. These findings are explained on the basis of inflammatory disease. The basic dissimilarity of direct visual and indirect röntgenological procedures is the obvious explanation for this wide disparity between observations, even within the same clinical material. Of the 96 patients reported to have a proved oesophagitis, specific underlying causes of one sort or another were recognizable in 51, whereas in 45 patients no causative factor could be proved. Review of the recorded röntgenological observations in the 45 examples of non-specific inflammatory disease of the oesophagus, reveals that stricture of from one to three centimetres in length was observed in 29 instances, and that more generalized narrowing of from three to 15 centimetres was observed in another 12 cases. While diminution of lumen width was the most notable röntgenological finding, irregularity of contour, demonstrable ulceration, associated mass, and perforation were also recorded. In three-quarters of these patients the lesion was restricted to the lower one-third of the oesophagus. Hiatus hernia, almost uniformly associated with visible shortening of the oesophagus, was clearly demonstrated in 22 of the 45 patients, indicating that protrusion of a portion of the upper end of the stomach into the thoracic cavity may well be a common and important causative agent in the development of oesophagitis. The röntgenological diagnosis of chronic hypertrophic gastritis is based upon observations which are difficult to define and to delimit. In general, as observed by fluoroscopic examination, this disease imparts to the mucosal pattern of the stomach an obvious coarseness of the mucosal folds which attracts the attention of the observer. Many factors operate to determine both the breadth and the height of the rugae. It is the task of the observer to determine, if possible, whether transient contraction of gastric musculature is responsible, or whether edematous or infiltrative processes in the deeper layers of the stomach wall have produced the appearance. The differentiation is not simple. Palpation under fluoroscopic control offers the most satisfactory answer for the radiologist, for, if he is unable to flatten out the mucosal ridges under direct observation, the likelihood that the appearance is due to swollen, enlarged folds of abnormal mucosa is certainly great. When a

coarsened mucosal pattern gives way to a normal appearance in the course of gastric filling and with the elapse of a few minutes of time, one can be readily convinced that the initial appearance was of no pathological significance. The radiologist is on sounder ground when mucosal overgrowth and coarseness are found in one segment only, although he may well be beset with worry as to whether the finding represents either a sessile neoplasm or a benign inflammatory disease. There is one expression of hypertrophic gastritis which is clearly and convincingly apparent to the radiologist. The lesion in question almost invariably involves the lowermost segment of the antrum immediately proximal to the pylorus for a distance of from three to ten centimetres. Here, in sharp contrast to the surface of the mucosa elsewhere within the organ, folds are high, broad and tortuous, and resistant to complete eradication, even with forceful manual palpation. The irregularity is not confined to the mucosal surface alone, for the lumen is ordinarily irregularly narrowed, without the degree of associated rigidity encountered in neoplasia. It is common to find the base of the uninvolved duodenal bulb indented by the hypertrophic portion of the stomach, and peristaltic activity, normally maintained at higher levels, is feeble or virtually absent through the deformed gastric segment. Ordinarily röntgenological examination, in patients with this condition, yields evidences of clearly apparent abnormality which are difficult to differentiate from primary neoplasm, and it is commonplace to repeat the examination once or twice before the latter situation can be eliminated. Actually it is sound practice to recommend surgical exploration in all such cases because the radiologist can scarcely distinguish between them with complete honesty. In this particular expression of hypertrophic gastritis it has been the authors' experience that gastroscopic examination may likewise be ambiguous, for the observer may never be able to introduce the instrument into the involved segment.

Spinal Osteomyelitis Associated with Urinary Tract Infections.

T. F. LEIGH, R. P. KELLY AND H. S. WEENS (*Radiology*, September, 1955) report nine cases of osteomyelitis of the spine developing during the course of urinary tract infection. The spread of the infection from the genito-urinary tract to the spine is discussed in the light of Batson's work in demonstrating numerous anastomoses between the venous plexus of the pelvic organs and that of the spinal column. In the majority of cases of spinal osteomyelitis following urinary tract infection, Gram-negative bacteria are found to be the offending agent. By means of aspiration biopsy the causative organism may be positively identified; this aids greatly in the selection of proper therapeutic procedures. A simple method of aspiration biopsy is outlined. Radiological evidence of a lesion in the spine lags behind the clinical manifestations by a matter of weeks or months. Quite frequently the initial films of the spine, made soon after the onset of the back pain, will show no

abnormalities. If such is the case, additional studies should be made every few weeks until the lesion is disclosed. The radiologist should not be content with röntgenograms of the suspected area only, since experience has shown that multiple levels are commonly involved. Adequate studies of the entire spine should be undertaken when osteomyelitis is discovered at one level. Two lesions may involve remote sections of the spine, and may manifest themselves at different times. Tomography is an important adjunct to the study of osteomyelitis of the spine. Minimal lesions which are obscure and equivocal on routine röntgenograms may be revealed on tomograms. This applies equally well to those more advanced lesions in which overlying structures obscure bony detail. The prognosis of this type of osteomyelitis is in general favourable, inasmuch as the healing tendency is pronounced, and extensive destructive changes are rare. Thus, the complete disintegration of one or of several vertebrae, such as is commonly observed in tuberculosis, is not to be expected.

Osteochondritis of the Talus.

W. L. DE GINDER (*Radiology*, October 1955) states that an unusual incidence of *osteochondritis dissecaans* of the talus has been directly related to ankle trauma sustained in jumping injuries. A follow-up programme with routine radiographic technique proved that such procedures permit detection of *osteochondritis dissecaans* before traumatic arthrosis develops. It also demonstrated that *osteochondritis dissecaans* occurs in ankles previously treated for severe sprains, and that the complication may remain undetected until severe joint damage has occurred. Aseptic necrosis of separated bone fragments occurred in every case of flake fracture of the talus observed in this series. When an injured ankle is first seen, it deserves added examination followed by correct treatment. Correct treatment cannot follow an incorrect or inadequate examination. A reasonably thorough routine radiographic examination constitutes an essential part of the physical examination of an injured ankle. The minimal routine radiological investigation should include antero-posterior and lateral views, and at least an internal oblique view of the talus. Only the most minor ankle injuries are safely treated by passive support by tape or elastic bandage with immediate resumption of activity. All others should be provided with protective immobilization and sufficient rest to permit healing and to allow opportunity for observation of progress. The injection of procaine and the resumption of activity are likely to promote unwarranted satisfaction on the part of the patient and a false feeling of accomplishment on the part of the physician, both decreasing the probability of proper treatment and follow-up. When a sprained ankle at rest fails to show very rapid healing within ten days, follow-up radiographs may reveal small impactions or flake fractures that were invisible prior to the physiological absorption of calcium along the line of crushed and broken trabeculae. It is conceivable, but not proved, that prolonged rest at this stage might permit

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primary healing in some of these cases that otherwise would proceed to aseptic necrosis. Any patient who complains of recurrence of pain after a relatively asymptomatic period of two or three months after treatment of a sprain should be reexamined to confirm or exclude the presence of *osteochondritis dissecans* of the talus. A follow-up examination two or three months after injury may be worth while in any patient who has suffered a severe ankle injury in a car crash, jump, or fall, where a strong downward driving force is coupled with inversion or eversion of the ankle. Radiographic diagnosis should be made before early necrosis and roughening of the articular cartilage become evident. Orthopaedic treatment at this stage can prevent the progressive traumatic arthrosis that is certain to occur if loose bodies are allowed to remain in the weight-bearing joint.

PHYSICAL THERAPY.

Bladder Growths Treated by a Solid Intravesical Cobalt Source.

D. G. BRATHERTON (*Brit. J. Radiol.*, September, 1955) states that the ideal method, and certainly the most effective, for the early vesical lesion is implantation of the base of the tumour with radon seeds or other radioactive material, under direct vision, with the bladder open. This procedure is, however, not applicable to patients with multiple lesions. These may be treated by deep X-ray therapy or by cystectomy. Deep X-ray therapy, although a valuable method, may produce tenesmus, colic and diarrhoea. Intracavitary irradiation may have advantages and may be given by a solid source or by the filling of the bladder with a radioactive liquid. A central solid source has advantages, particularly that the depth dose is higher and, therefore, malignant cells in the muscle layer may be reached. One major difficulty of the central source is that of ensuring that it remains centrally placed in the bladder. The author describes a type of balloon which inflates symmetrically, and which is carried on a metal catheter with a double channel, a smaller one for inflating the balloon, and a larger one for carrying the radioactive cobalt slug. The drainage of urine takes place from two holes, one at the apex of the bladder and the other at the internal meatus. The source of radioactive cobalt is such that a dose of 3000r is given on the surface of a sphere of 150 cubic centimetres in twenty-four hours. The balloon is distended by a sterile 5% solution of sodium iodide, to which is added a small percentage of dye, so that a leak can be detected in the bottle containing the urine. The method is suitable only for the case in which the spread of the tumour is superficial rather than deep. A dose of 3000r is given in twenty-four hours and repeated one week later to give a total of 6000r on the surface of the bladder in eight days. A total of 36 growths has been treated by this method; 24 of these were malignant neoplasms and 12 were papillomata. Of 16 patients proved on microscopic examination to

have carcinoma, five remain well at two years, three have recurrent lesions, and eight have died. The author believes that early carcinoma of the bladder should be treated by radioactive implant; the more advanced infiltrating growth should be treated by deep X-ray therapy, and between the two there is a place in therapy for radioactive balloon treatment.

Concentration of Radioiodine in the Human Pituitary Gland.

A. F. PHILLIPS (*Brit. J. Radiol.*, August, 1955) examined the radioactivity, by means of the Geiger counter and by autoradiography, of the pituitary gland in a thyrotoxic and diabetic woman, who died twenty-three hours after the administration of two millicuries of radioactive iodine. The uptake of radioiodine by the pituitary gland has been studied in animals by a group of French workers. In rabbits, killed two hours after the intravenous injection of radioiodine by the intravenous route, they found concentration of activity on the posterior lobe, when the compound was injected in the form of I^{131} -labelled thyroxine, but not when it was injected as iodide. Jensen and Clarke, who investigated rabbits killed four hours after injection of I^{131} -labelled thyroxine, found pronounced uptake in the posterior lobe of the pituitary gland and the *tuber cinereum*, less uptake in the infundibulum, and only slight uptake in the anterior lobe of the pituitary gland and the mamillary bodies. Autoradiographs show a fairly uniform darkening over the whole posterior lobe. In the case discussed in the paper, autoradiographs revealed an unexpected distribution of the activity, which was highly concentrated in small groups of cells, some situated on the posterior surface of the gland and others between the *pars anterior* and the *pars nervosa*. Slight activity was also present at many points in the capsule of the gland and at a few scattered points in the *pars anterior*. Neither the *pars nervosa* nor the colloid-containing follicles of the *pars intermedia* were found to have autoradiographs above background level. The situation of some of the active groups of cells in the capsule of the pituitary suggests that they may not be part of the pituitary proper, but may be associated with the meninges or with the vascular system, and this suggestion remains a possibility. As to the question of metastatic carcinoma of the thyroid, there was no pathological evidence for such a diagnosis in this patient either in the thyroid or elsewhere, and clinical evidence was against it. The absence of organically bound radioiodine in the *pars nervosa* is in contrast to the results obtained in rabbits. If the patient had lived, and if the decline of activity had followed a similar time course to that of the thyroid activity, the maximum local dose would have been of the order of 750 rep, while a few very small volumes, of diameter one millimetre or less, would have received average doses of the order of 400 rep. These doses would have resulted in the present case from the administration of only two millicuries of I^{131} . A dose of this order of magnitude to cells in the pituitary, associated with thyroxine metabolism, may be of significance in the treatment of thyro-

toxicosis by radioiodine. The possibility of an action on the pituitary, due to the much larger amounts of radioiodine sometimes administered in cases of carcinoma of the thyroid, may also have to be considered.

Radioactive Colloidal Gold in Carcinoma of the Ovary.

C. L. LEWIS (*J. Fac. Radiol.*, July, 1955) summarizes experiences at Oxford in the use of radioactive colloidal gold for the treatment of malignant disease of the ovary. The half life of the isotope Au^{198} is 2.7 days, and it is both a β -ray and a γ -ray emitter. When colloidal gold is instilled into the peritoneal cavity, the amount which escapes into the blood and regional nodes is, during its active life, negligible for practical purposes. Theoretically, it is a simple way of irradiating the peritoneum and any seedling growths on it. There are two obvious limitations to its usefulness: firstly, the dosage due to β radiation greatly overshadows that due to γ radiation, and β radiation has a maximum range in water of 3.8 millimetres. This obviously limits the size of any peritoneal deposit which could logically be expected to be destroyed by its use. Secondly, one cannot be certain that all of the peritoneal surface is adequately treated. In all the patients treated by the author a saline drip into the peritoneum has been instituted, the standard drip apparatus for the intravenous route being used, but with a cannula instead of needle at the point of insertion. Where there has been obvious ascites, as much fluid as possible has been drained out by paracentesis. From 200 to 300 cubic centimetres of saline have been injected with the gold, the actual time for instillation of the gold has been of the order of a minute, and the amount used has been from 125 to 150 millicuries. As soon as possible after the gold has been given, distribution has been aided by turning and inclining the patients in movements similar to those described by Walton and Sinclair; and survey counts with a scintillation counter have been made. In the selection of cases, radioactive gold has been used in both radical and palliative treatment. For radical treatment, it has been used in the absence of gross metastases in patients in whom, at operation, free fluid was found in the peritoneum, spill of malignant cells into the peritoneum was thought to have occurred on either surgical or histological evidence, or small peritoneal seedlings were actually found at operation. It has been used palliatively where ascites has been the presenting symptom. In a total of 45 patients with carcinoma of the ovary seen in the author's department between May, 1951, and November, 1953, only 19 have been treated by radioactive gold. Recently, it has been used more frequently. Of seven patients treated more than a year ago with Au^{198} as part of their treatment, since either free fluid was found or spill of the tumour was thought to have occurred at operation, four are well, with no recurrence over a year later, and three have died, only one with ascites. The treatment has disturbed the patients very little. The results are, however, impossible to evaluate statistically in this series.

Medico-Legal.

AN APPEAL BY IGNACY ANDREW LISTWAN.

THE following is the judgement delivered by the Honourable K. W. Street, Chief Justice of New South Wales, in the Supreme Court of New South Wales on February 29, 1956, in the matter of an appeal by Ignacy Andrew Listwan *ex parte* Listwan: Re New South Wales Medical Board. The case was heard by the Full Court, Mr. Justice Street, Chief Justice, Mr. Justice Roper, Chief Judge in Equity, and Mr. Justice Herron.

The judgement was in the following terms:

This application to the Court originated in two forms, one an appeal against a decision of the New South Wales Medical Board, and the second an application to this Court to make absolute a rule nisi for a writ of mandamus.

So far as the appeal, which purported to be made under s.19 of the *Medical Practitioners Act, 1938*, is concerned, I think it is sufficient to say that it was not pressed by the applicant that an appeal would lie, neither was it argued on behalf of the respondent to the application for mandamus that an appeal was available, and for that reason, another remedy being open to the applicant, the Court should not entertain the application for the writ of mandamus. Speaking for myself, I am satisfied that this is not a case in which it would be possible to approach the Court by way of an appeal, and therefore, it seems to me, nothing more need be said about that application.

The substantial matter, however, which has been argued is whether this Court should order the issue of a writ of mandamus directed to the respondent members of the Medical Board requiring them to amend the entry in the register of medical practitioners so as to disclose certain further qualifications which the applicant claims to possess.

The facts, broadly, are that the applicant was a Polish national, born in Poland in 1910. He migrated to Australia in 1948 and became a naturalised British subject in 1954. Prior to his entry into Australia he had been practising as a physician in Poland and had practised also, according to his own affidavit, in other parts of Europe and in the Middle East. He studied at the Cracow University, and in 1934 graduated and obtained the degree of physician from that university. He was required to undergo a period of six years' training and to submit himself to the recognised examinations, and it would appear that on obtaining that degree he became entitled to practise as a physician in Poland. In 1937, as the result of a thesis prepared by him on a subject relating to neurology and psychiatry, he obtained the degree of Doctor of Medicine from this same university. When he came to Australia in 1948 he applied to the N.S.W. Medical Board for registration as a legally qualified medical practitioner under the provisions of s.17(2) of the *Medical Practitioners Act, 1938*. That section, in effect, provides that if a person proves to the satisfaction of the Board that he has attended a regular course of medical study for five or more years in a school of medicine, either in some other part of the British Empire or in any other country, and has received after due examination from that university a degree which is recognised as certifying to his ability to practise medicine or surgery, and if the Board also reports to the Minister that such person has special qualifications and has had special experience in the general practice of medicine and surgery or some special branch, then compliance with other requirements by s.17(1) may be waived and a recommendation may be made to the Minister which, if approved by the Minister, will entitle the applicant to be registered as a legally qualified medical practitioner.

That application was refused and the Board declined to make any recommendation. But the Board did certify that the applicant's qualifications were such that he was a person who might properly be permitted to sit for the examinations prescribed by the Senate of the University of Sydney for students in the Faculty of Medicine, and if he then passed the Fourth, Fifth and Final Degree examinations in that university he would be entitled to apply for registration. He did sit for the examinations in the Sydney University and did pass all the necessary examinations in the fourth, fifth and sixth years, and on completion of those examinations he obtained a certificate from the Registrar to that effect, and having furnished that certificate to the Medical Board, he was granted provisional registration as a medical practitioner on 17th December, 1951, by the then President of the Board. That was done pursuant to special provisions made in that regard.

In the month of January, 1952, the applicant was duly registered as a medical practitioner under the Act, and the qualifications stated to have been furnished on registration were "Registered in accordance with the provisions of section 17(1)(c) of the *Medical Practitioners Act, 1938-1950*". Subsequently to his having been registered as a legally qualified medical practitioner, under other rules within the University of Sydney he sat for further examinations and ultimately, in 1955, obtained in that university the degrees of Bachelor of Medicine and Bachelor of Surgery. These two degrees are entered against his name in the register of medical practitioners for New South Wales as additional qualifications.

The applicant is apparently specialising in neurology and psychiatry and holds honorary positions in two recognised hospitals in Sydney. He desires to become a member of the Australasian Association of Psychiatrists, but he is unable to do so because the rules of that Association require that he must have a post-graduate degree noted on the register of his qualifications to be admitted to the register of legally qualified medical practitioners. In the form in which his name appears in the register no reference is made to that degree or to any facts affecting him, the only reference being a statement that he was registered under a particular section and sub-section of the Act. The question for this Court is whether he has shown that the members of the Medical Board have failed to carry out the obligations resting upon them under the Act and whether the applicant is entitled to have the register altered so as to read in the form in which he asks it should.

The *Medical Practitioners Act, 1938*, provides for the constitution of a Medical Board—those provisions not being material—and by s.15 of the Act the Board is directed to keep a register, to be called the "Register of Medical Practitioners for New South Wales". Sub-s.(2) provides that a person shall be registered by the entering in the register of (a) his full name and address; (b) the date upon which he is registered; (c) particulars of the qualification or qualifications in respect of which his registration is granted. Sub-s. (3) provides that there may also be entered in the register in respect of any registered person particulars of such further or additional qualifications possessed by such registered person as the Board may direct shall be so entered, and particulars, *inter alia*, of any certificate, diploma, degree, licence, testimonial or other title or description which such registered person is authorised by the Board to use in relation to himself as a medical practitioner or in the practice of his profession as such. The importance of having all these particulars registered is emphasised by the provisions of s.27 of the Act, for under the definition of "infamous conduct in any professional respect" dealt with in that section, is the use of any certificate, diploma, membership, degree, licence or other title relating to himself as a medical practitioner or in the practice of his profession as such, other than those (if any) which the Board has authorised, in pursuance of s.15(8)(b) of the Act, to be entered in respect of such registered person in the register. Unless, therefore, any special qualifications which a legally qualified medical practitioner may possess be entered as particulars in the register, it is infamous conduct on his part to use those qualifications or make reference to them in his practice; and of course infamous conduct on the part of a medical practitioner may have very serious consequences.

The applicant desires to have recorded the fact that he is an M.D. of the Cracow University and the Board has refused to put that statement of fact that he is such a graduate into his qualifications in the register. The Board is perfectly prepared to enter the fact that he has graduated in the Sydney University and has the two degrees to which I have referred, and those have, as I said before, been entered as additional qualifications. No explanation has been furnished to this Court explaining the refusal of the Board to make this entry or showing reason why the Board reached the conclusion which it did that this particular qualification should not be shown. The matter comes before the Court, therefore, as a simple question of the proper view to take of the language contained in the relevant sections of the Act and whether the description of the qualifications of a legally qualified medical practitioner merely by reference to the section of the Act under which he qualifies is a sufficient statement of his qualifications to comply with the requirements of s.15(2). If the Board's view is right, that all that need be put into the register is a mere reference to the section in an Act of Parliament and a statement that that section has been complied with, then the holder of a degree in the Sydney University would be entitled to nothing more than an entry in the register that he had been registered as qualified under the provisions of s.17(1)(a) of the Act. If that is taken as an example, it seems to me to show the total inadequacy of such a description as a purported

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compliance with the direction in the Act that "particulars" are to be given. S.15 is specific and requires particulars of the qualification or qualifications in respect of which his registration is granted.

In the present case the President of the Board, in communicating with the Registrar of the University of Sydney, informed the latter that the applicant had the qualification of "M.D. Cracow, 1937" and had in the opinion of the Board satisfied the conditions of s.17(1)(c)(i), which is that he must have a degree, and also of s.17(1)(c)(ii)—that he was registered in his own country and entitled to practise as a medical practitioner. It might have been argued that the real basis of the applicant's right to practise in Poland was his baccalaureate, which he obtained by examination on completion of the six years, and not the doctorate which he obtained some three years later, but it was not suggested by counsel for the Board that the position was other than this, namely, that the baccalaureate had become merged in the doctorate, and the Board always treated the applicant as entitled to rely upon his doctorate in Cracow as the degree which justified the Board in certifying to the fact that it was satisfied that the applicant fell within the provisions of s.17(1)(c)(i). In all other certificates and references to his degrees in Poland he is described as "M.D. Cracow, 1937", as for instance in the provisional registration signed by the President of the Medical Board and dated 17th December, 1951. When he had fulfilled the other obligations of s.17(1)(c), namely, had passed the examinations referred to in para. (iii) of that sub-section, then he became qualified on the previous finding of the Medical Board, plus his passing these examinations, to be entered upon the register. In my view, what should have been inserted in the register in compliance with the provisions of the Act were the particulars of his qualifications.

To give particulars requires something more than a mere general statement applicable in terms to a large number of individual cases, all differing in detail. What is to be given is particulars of the qualifications of the individual concerned whose name has been placed upon the register. This involves express mention or enumeration of his qualifications with sufficient information as to details to show, with reasonable exactitude, those qualifications upon which the applicant's right to registration is based. In the present case those particulars would at least require mention of the specific foreign degree which was the foundation of his right to sit for the examinations prescribed by s.17(1)(c)(iii). An inspection of the register would then disclose to any searcher an exact, though brief, account of the original and subsequent academic qualifications possessed by the individual concerned which formed a necessary part of his qualification for registration. It is the personal particulars of the individual concerned which must be registered, and the Act is mandatory in this respect.

The applicant's qualifications were three: first, his degree in the Cracow University; second, his right to practise medicine in Poland; and thirdly, the fact that he had passed the requisite examinations in this country. Those were the qualifications which gave him the right to be entered on the register, and those were the qualifications the particulars of which should have been entered when he was originally registered in January, 1952. It is impossible, it seems to me, to hold that a mere reference to a section in an Act of Parliament is a furnishing of "particulars" in the register. The Act compels the entry in the register of the details upon which the Board authorised the applicant's name to appear therein, and those details or particulars in this case were the three which are comparable with the three always referred to in the register when registration is effected under s.17(2). Under s.17(2), of course, the position is different, because the qualifications there are the foreign degree, the recommendation by the Board, and the approval of the Minister, and in all the cases to which we were referred those particulars are always given in the register kept by the Board as far as those individuals are concerned. Similar particulars are required by the Act to be entered in relation to those who qualify for registration under s.17(1)(c). In the present case those particulars have been omitted, the entry contains no "particulars" at all within the meaning of that word as used in s.15 and is defective, and the requirement of entry of particulars being mandatory and the Board being bound to enter proper particulars, I think that it has failed to carry out the statutory prescription and its statutory obligation, and the applicant is therefore entitled to the relief which he now seeks.

The form in which the rule nisi is framed and the order which was asked was that a mandamus should issue to the Board and the members thereof commanding it and them to amend the Register of Medical Practitioners for New South Wales so as to include in the registration of the applicant

the qualification of "M.D. Cracow, 1937". I think that he is entitled to have that inserted as one of his qualifications for registration, for the Sydney degrees did not qualify him. He did not obtain those until 1955, and he had been registered since January, 1952, and it is the qualifications upon which he was registered in 1952 which must appear as particulars in the register. I think, therefore, that the rule nisi should be made absolute and an order made in the form in which it is asked for in the rule nisi.

It was argued to the Court that if the applicant were successful and the rule were made absolute there should be no order as to costs inasmuch as the application is based on a different ground from that upon which the original application was made to have the Cracow degree inserted. It was sought originally to have it inserted as an additional particular. But that is not the true position. It should be inserted as one of the original particulars of qualifications, and the additional particulars are the degrees which the applicant subsequently obtained at the University of Sydney and which have been entered as such in the register. Although the basis of the claim was changed, I think the point was well taken in the grounds upon which the rule nisi was obtained, particularly as I understand it was agreed that reference might be made to such proceedings as there were in the appeal, and in those circumstances, the Board having failed and the applicant having succeeded, I see no reason for depriving the applicant of his costs.

In my opinion, the rule should be made absolute, with costs against the respondent Board.

ROPER, C.J. in Eq.: I agree.

HERRON, J.: I likewise agree.

STREET, C.J.: The appeal will be dismissed, but the rule nisi for the issue of a writ of mandamus will be made absolute, with costs.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital, Camperdown, on May 19, 1956. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staffs of the hospital. Part of this report appeared in the issues of March 3 and 17, 1956.

Extradural Haematomata.

DR. W. LISTER REID showed two patients who had recovered after suffering from extradural haematomata.

A man, aged thirty-seven years, had suffered a head injury at six o'clock in the morning. He was at first unconscious, but recovered at 9 a.m. in the casualty department of a suburban hospital. He was observed for a further three hours and was about to go home when he became drowsy and then unconscious. He was transferred to the Royal Prince Alfred Hospital and was found to have right hemiparesis and a dilated left pupil. Plain X-ray examination showed a linear fracture in the left parietal region. Arteriography showed a space-occupying lesion of extracerebral nature on the left side. Craniotomy revealed the lesion to be a very extensive extradural haematoma extending from the mid-temporal region to the occipital pole. After transfusion of two pints of blood the patient made a rapid recovery.

A man, aged twenty-one years, had been in a motor accident and suffered severe head injury with subsequent unconsciousness. Consciousness was recovered in twelve hours, but slow deterioration took place in the subsequent twelve hours with signs of cerebral compression. The provisional diagnosis was made of extradural haematoma, and a right fronto-temporal burr-hole was made in the usual fashion, but no lesion was found. The patient was allowed to recover for a few days, and then arteriography and ventriculography showed the lesion to be a right frontal or polar extradural haematoma. That was found and evacuated through a right frontal burr-hole, and the patient made a good recovery.

Multiple Meningioma.

Dr. Lister Reid also showed a woman, aged forty-eight years, who had suffered from weakness of the right leg with foot-drop for eight years, fits of Jacksonian type on the right side for two weeks and generalized fits for a

week. She was found to have early papilloedema and increased reflexes with clonus on the right side. Plain X-ray examination showed the outlines of two large masses, one in the left frontal region and one in the left parietal region with linear and spotted calcification. Arteriography confirmed the finding that the masses were meningioma of very large size. Each of the two large growths was removed in two stages, and at the operations the presence of many other dural meningioma was noted. The size varied from a few millimetres to several centimetres in diameter, and the nodules could be seen and felt over the convexity of the dura and on the falx. Convalescence was uneventful.

An Unusual Eighth Nerve Tumour.

Dr. Lister Reid's next patient was a man, aged twenty-five years, who had been suffering from a left cerebellar lesion characterized by incoordination, disturbance of gait, nystagmus and papilledema. At operation no cerebellar tumour was found, but deep in alongside the pons was a dense meningioma-like mass. Intracapsular removal was performed in two stages, and the patient made an excellent recovery.

Acromegaly due to Pituitary Tumour Treated Surgically.

Dr. Lister Reid's last patient was a woman who had a history of amenorrhoea and enlargement of the jaw, hands and feet. Examination revealed that she had acromegaly but no visual impairment. Plain X-ray examination showed an enlarged pituitary fossa. Craniotomy was performed and a pituitary tumour removed. After operation transient diabetes insipidus was controlled by means of "Pitressin". Menstruation returned after four months, the hands and feet became smaller and the facial distortion regressed.

Secondary Amenorrhoea.

DR. J. W. KNOX, DR. M. STENING and DR. MARGARET MULVEY showed a single woman, aged twenty-eight years, who had presented herself for advice in January, 1954, complaining of secondary amenorrhoea for two years. She had menstruated regularly from the age of thirteen years and eight months, but while she was away living in London menstruation had ceased. She attended a gynaecological clinic and received courses of hormonal therapy, and some bleeding was induced on two occasions. Although she had been advised not to worry over the amenorrhoea, her health had now deteriorated into a depressed condition very akin to involutional melancholia. Physical examination showed no abnormality apart from a slight enlargement of the right ovary. It was felt that the amenorrhoea was the cause of her mental symptoms. Low dosage irradiation was given to the pituitary gland and ovaries according to the method of Kablani, of New York. Within a month menstruation occurred, and her mental state improved. Normal menstrual cycles continued during the subsequent fourteen months except for one period which failed to appear in February, 1955. The comment was made that indiscriminate or wide use of such X-ray therapy was certainly not justified. However, the patient was presented as an example of the effective relief of a distressing mental and physical state.

Pregnancy following Bilateral Tubo-Uterine Reimplantation.

Dr. Knox presented two patients who had become pregnant after bilateral tubo-uterine reimplantation.

A married woman, aged twenty-six years, had complained of primary sterility for four years. Her husband's seminal fluid was not abnormal. Hysterosalpingography, repeated again after three months, indicated occlusion at the uterine cornua. In May, 1954, the Fallopian tubes were freed from adhesions, the interstitial and isthmal portions of each tube were excised, and the patent ampullary portions were reimplanted through the cornua. The two ends of a length of polyethylene tubing were passed up through the cervix and through the right tube before the anastomosis was sutured. The tubing was left projecting an inch or so into the pouch of Douglas, but was removed fourteen days after operation. The anastomosis was completed on the left side without the use of polyethylene tubing. Twenty-four days after operation utero-tubal insufflation showed normal patency of the tubes at 85 millimetres' pressure. After the patient's next menstrual period, which began six weeks after the operation, she became pregnant. At term she had been in hospital for several days with severe toxæmia, when breech presentation recurred. X-ray pelvimetry showed that she had a gynæcoid flat pelvis with a curved sacrum. It was decided not to risk breech delivery, and Cesarean section produced a healthy living boy. Both mother and infant did well subsequently.

In the second case the utero-tubal anastomosis was made without the use of polyethylene tubing. The patient, a married woman, aged twenty-five years, had become pregnant three times subsequently to bilateral resection and reimplantation of tubes, and had had one pregnancy prior to the occurrence of cornual occlusion. In the first pregnancy the fetus died *in utero* from an unknown cause and was stillborn in a lacerated state at term. At the second pregnancy, which occurred after operation, the fetus was suffering from *hydrops foetalis* and was stillborn in a lacerated state at the thirty-seventh week of pregnancy. In the third pregnancy, neonatal death followed replacement transfusion at the thirty-ninth week of pregnancy. Labour was spontaneous. The patient was now twenty weeks pregnant in the fourth pregnancy. Anti-Rh agglutinins had been first detected in her serum after her second baby was born. They were now present in high titre.

Pelvic Hydatid Cyst.

Dr. Knox also showed a married woman, aged forty-nine years, who had suffered from severe pain in the right iliac fossa for forty-eight hours one week prior to seeking advice in December, 1954. She had had five children, and her menstrual rhythm was normal. Her gall-bladder had been removed three years previously. She had had seven abdominal operations since the age of twenty-five years for intraabdominal hydatid disease. When admitted to hospital for her present illness she had a cystic swelling filling the upper part of the pelvic cavity and attached to the anterior surface of the sacrum. It seemed to be separate from the ventrofixed uterus. It was considered that laparotomy would be required to distinguish between a pelvic hydatid cyst and an ovarian carcinoma or cyst. Dilatation and curettage revealed normal endometrium. When the abdomen was opened, a retroperitoneal hydatid cyst was found in the pelvic cavity behind the uterus extending down to the recto-vaginal septum. The contents of the cyst, about two pints of fluid and daughter cysts, were removed. The cyst wall was then excised without difficulty. The post-operative course was uneventful.

Desmoid Tumour.

Dr. Knox's last patient was a married woman, aged twenty-eight years, who had sought advice on November 19, 1953, with a history of dyspareunia of six months' duration, which was becoming worse. She had suffered from dysmenorrhœa, especially premenstrual pain, since the birth of her second child two and a half years earlier. On examination of the patient, a tender induration could be felt near the mid-line above the pubes. The swelling was affecting the deep fascia and also lying deep to it. The uterus was ante flexed, retro posed, mobile and normal in size. The diagnosis was made of possible desmoid tumour of the rectus sheath. At operation, after dilatation and curettage, the swelling was exposed and excised. It was densely attached to the posterior aspect of the *symphysis pubis*. The entire width of the rectus muscles had to be cut across to remove the tumour as a whole. The wound healed without weakness, and there was no recurrence of the tumour in the subsequent seventeen months. The pathological features were typical of desmoid tumour.

Dut of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

ASSISTANT SURGEONS.¹

[Extract of a letter from the Right Honorable Henry Dundas, one of His Majesty's Principal Secretaries of State to Major Grose dated Whitehall, 15th November, 1793.]

"Mr Thompson who will succeed Mr Arndell as an Assistant Surgeon will go out in some one of the vessels I have mentioned in the beginning of my letter and by one of His Majesty's Ships which will follow a Mr Leeds will go out as an Assistant Surgeon upon whose arrival Mr White will certainly be at liberty to return home."

¹ From the original in the Mitchell Library, Sydney.

"It may be proper to add here that it is intended that the Assistant Surgeons shall succeed to the office of Chief Surgeon by rotation and according to the Seniority from the dates of their Commissions."

A true extract from the original Despatch.

JOHN MCARTHUR,
Secretary to the Colony.

Special Correspondence.

NEW ZEALAND LETTER.

FROM OUR SPECIAL CORRESPONDENT.

Cancer Research in Auckland.

THE Auckland Division of the British Empire Cancer Campaign Society sponsored a public appeal in 1955 for the purchase of a linear accelerator for use in Auckland Hospital. A remarkable response placed £70,000 additional funds at its disposal after meeting the original aim. This money was allocated to research. Dr. J. F. Burton, pathologist, who was already on the Society's staff working at Auckland Hospital, was asked to visit the National Cancer Institute, Bethesda, Maryland, the Sloan-Kettering Institute in New York, the Children's Cancer Research Foundation in Boston, the Chester Beatty Institute, and other institutions, and the following programme has been adopted since his return:

1. He will develop his laboratory for screening chemical substances for anti-cancer activity, using inbred mouse strains from Sydney and Philadelphia, and sarcoma S180, later to be supplemented with a breast tumour 755 and a leucæmia (L1210).

2. Parallel with this, Auckland University College, under Professor L. H. Briggs, of the organic chemistry department, will appoint two full-time chemists, one of senior lecturer and one of lecturer status, to work with Dr. Briggs on the isolation and preparation of chemical substances occurring in the unique flora of New Zealand and adjacent territories. Such substances would be tested by Dr. Burton, and elsewhere if necessary, for anti-cancer activity. This admittedly empirical approach, very freely used abroad in cancer and antibiotic research, was approved for Auckland. The British Empire Cancer Campaign would maintain these workers and participate in a joint advisory committee to consider their appointment by Auckland University College. A later development might possibly be the appointment of a biochemist for the alteration of promising products.

3. A clinical research worker and support for the record and statistical side of clinical cancer work in Auckland are to be the subject of an early report by the Research Committee.

Correspondence.

PAYMENT OF RESIDENT MEDICAL OFFICERS.

SIR: The recent system of payment for resident medical officers introduced by the New South Wales Hospitals Commission invites protest. It is said that the British Medical Association approved the scheme. If so, it has surrendered a principle for a group of its members which for years it has been defending for the profession as a whole, that of payment in accordance with service rendered. Henceforth each New South Wales resident medical officer is to be paid on a scale which alters only with his seniority in years of service in the New South Wales hospitals, as distinct from the nature of the post he holds. There has been an overall rise of salaries at which rejoicing. Even the old-time practitioner who in his years of hospital training received "merely pocket money" will hardly begrudge this move. The need to keep an adequate number of young graduates in the hospital service when remuneration "outside" has risen so markedly makes the pay rises virtually essential, and this alone should assist in attracting young doctors to remain in the hospital service. More experience is an aid, but not a guarantee, when a candidate applies for a higher

ranking and more responsible hospital post, and this previously carried a proportionately higher salary. To allow for the problem of certain posts being permanently hard to fill, for example, in some country hospitals, the law of supply and demand might be met by "upgrading" such posts as is done in hospitals under the United Kingdom National Health Service. But there is no necessity for this unworthy inappropriate scheme of grading salaries according to seniority.

There are other anomalies. The "barbarism of borderism" was one comment applied, referring to the fact that a New South Wales hospital registrar who has spent his earlier years of hospital work overseas or even in a neighbouring State is to receive the salary of "first year resident". A graduate in the same hospital holding a less responsible post, if he has worked only at New South Wales hospitals, draws a higher salary according to years involved. Does the British Medical Association really wish to encourage young New South Wales graduates to "stay at home" or others to "stay away"?

Perhaps it is an exaggerated fear that the more senior "hospital servant" who desires special training, for example, in obstetrics, may stand at a disadvantage when competing for a requisite post against one more junior and therefore less "expensive". This might at least have some influence on his chances in a time of depression.

Resident medical officers accept everything that comes—"only a few years" has always been the philosophy, and training comes first—and the immediate overall pay rises reduce plaint. But the British Medical Association might take a longer view when negotiating for a branch of the medical services which, whatever the system of payment, is likely to expand.

Yours, etc.,

HELEN B. WILES,
Member of the British Medical
Association.

4 Blaxland Road,
Bellevue Hill,
New South Wales.
March 5, 1956.

TOXICITY OF "XYLOCAINE".

SIR: The increase in the number of reported cases of toxicity associated with the use of "Xylocaine" (lignocaine hydrochloride) for local anaesthesia indicates some uncertainty regarding the safe dosage. This uncertainty, together with an increasing usage of this drug, is no doubt responsible for accidents which should be avoidable. The time is opportune to review the facts and briefly report a further case with which I was recently associated, in an endeavour to prevent future accidents.

Mrs. A, aged twenty-three years, had an uncomplicated ante-natal course and came into the Queen Victoria Maternity Hospital on October 9, 1955, in the first stage of labour. Progress was normal through the first stage, and a pudendal block and infiltration anaesthesia was selected for a low forceps delivery, indicated by delay in the second stage of labour.

In all, 40 cubic centimetres of 2% lignocaine (0.8 grammes), together with hyaluronidase, was injected, 10 cubic centimetres being placed round each ischial spine and 10 cubic centimetres used to infiltrate each ischial tuberosity area and labium. The usual precautions were observed to prevent intravascular injection. Ten minutes later, just as a live baby was delivered by low forceps, the patient was very drowsy and rapidly developed convulsions. These were of the usual epileptiform type, and they became confluent with a fatal termination within thirty minutes of the injection.

A full autopsy investigation revealed no other reason for death than lignocaine toxicity.

The toxic effects of lignocaine are drowsiness, passing on to coma and convulsions. Many reports refer to drowsiness after injection—others go further and report convulsions which may end fatally.

Recently Dutton (1955) reported a case of convulsions following the obstetric use of 80 cubic centimetres of 1% lignocaine (0.8 grammes) used without adrenaline, with recovery. Carnegie and Hewer (1950) reported a series of 138 cases and stated that the dosage is the same as that of procaine, that is, 1.0 grammes. They also observed that the anaesthetic action of a 0.5% solution with adrenaline lasted almost as long as with a 2% solution. Gordh (1949) says: ". . . when the amounts used were less than 1 Gm.

no toxic reactions have hitherto been observed." He therefore suggests 0·5 to 1·0 grammes lignocaine hydrochloride as a safe dose. The literature shows us plainly that fatal cases have occurred using less than 1·0 grammes.

More important than the total dosage is the concentration, and much work has been done to prove that the toxicity of local anaesthetics increases geometrically rather than mathematically. Thus 100 cubic centimetres of 1% solution (0·5 grammes) is more than twice as safe as 50 cubic centimetres of 1% (0·5 grammes) of the same solution.

Crawford (1953) says: "Xylocaine should be used in lower concentrations than procaine because of its greater activity and toxicity. Xylocaine should be used in half or less than half the concentration of procaine."

It is apparent from the literature and from clinical experience that "Xylocaine" is a most effective and useful anaesthetic, and there should be no question of abandoning such an agent. Provided it is used in 1% solution in no greater quantity than 100 cubic centimetres (0·5 grammes) and preferably less, particularly for obstetric use where the field is very vascular during labour, no toxicity should be encountered. The concurrent use of hyaluronidase will accelerate its absorption and therefore its apparent toxicity, while adrenaline (1:250,000) will retard its absorption. It would appear unnecessary to use either of these when using "Xylocaine". The reason for the many toxic effects reported would seem to lie in the use of solutions stronger than 1%, and it is rather disturbing to read, in a recent issue of *The Journal of Obstetrics and Gynaecology of the British Empire*, Hibbard and Grassie (1955) giving the impression that "Xylocaine" is without toxicity. In their series of 138 cases of pudendal block they used both 1% and 2% solutions and reported no cases of toxicity. They appeared to use about 12 cubic centimetres of a 1% solution on both sides, making a total of 24 cubic centimetres (0·24 grammes). They also combined hyaluronidase and adrenaline, and it would appear that the low dosage, in spite of the higher concentrations, was the reason they encountered no toxicity. Perhaps the occasional operator may need to use more than 24 cubic centimetres, and here is the danger.

My anaesthetic colleagues join me in advocating solutions of 0·5% "Xylocaine", except in special cases, in expert hands.

The correct treatment of convulsions, if they should occur, is intravenous thiopentone.

Yours, etc.,

L. O. S. POINDEXTER,
Director of Obstetrics.

University of Adelaide,
Adelaide,
March 6, 1956.

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THE NATIONAL HEALTH SERVICE.

SIR: Some criticism seems to have arisen out of the present health scheme about the way in which some practitioners seem to conduct their affairs, and since such criticism appears to follow a similar pattern in all countries where liberal schemes have been tried out, I should like to draw attention to its mechanism, its causes and the intention of the forces behind such "revolution":

1. Ill-considered shortage of doctor propaganda. Great publicity to exceptional doctors' gross earnings and advertising gross takings only in the professional Press. No publicity of actual net earnings in relation to the basic wage; silencing "dead" of publicity of the amount of work done by doctors free or at reduced rates.

After this has been working for a while:

2. Study free for all, mass graduations at universities to meet the imagined "shortages", while the national need from the insurance point of view is one doctor per thousand inhabitants on the register or one general practitioner per two thousand inhabitants. The community "can absorb" much more, but not without unnecessary expense.

After this has been going on for a while:

3. Hospitals are run by cheap resident medical labour under the pretext of "training", while the number of honoraries is reduced to a minimal few top specialists. Any fall off in mass graduation by universities causes an outcry of "shortage" of residents.

After this has been working for a while:

4. Exploitation of insurance schemes by doctors trying to build up or expand their practices on diminishing relative numbers of patients (rate falls below one per 1000). Glaring publicity for misuses.

After this has been going on for a while:

5. The enraged public enforces restrictive legislation interfering with the doctor-patient relationship.

The pattern seems an inevitable one, because where specializing begins at the age of twelve to facilitate the passing of first year medical examinations, and general education must correspondingly be minimal, while universities themselves do not restrict their intake on a selective basis, apart from a very limited non-specialized background, there is just no stop to this development. *Videant Consules!*

Yours, etc.,

February 26, 1956.

"Kassandra".

THE TOXIC EFFECTS OF CHLORAMPHENICOL.

SIR: Although the first reference in medical literature to the toxic effects of chloramphenicol is a report in *THE MEDICAL JOURNAL OF AUSTRALIA* (1950), the danger of administration of this drug does not appear to be generally recognized in this country.

During the past eighteen months I have seen six patients who suffered from aplastic anaemia after taking chloramphenicol. Two of the patients were close relatives of doctors. In this small series of cases there were four deaths.

Over the same period of time, the only other cases of aplastic anaemia which I have seen have been due to benzol poisoning. Benzol and its compounds are among the most potent noxious agents known to hematologists, and it is not without significance that chloramphenicol is a benzol compound.

Chloramphenicol is widely used in the treatment of minor infective disorders, such as sinusitis, influenza and whooping-cough. It is recommended that its use be restricted to serious infections in which life is endangered.

Yours, etc.,

JOHN A. MCLEAN.

34 Queen's Road,
Melbourne, S.C.2.
March 9, 1956.

Reference.

- GILL, P. F. (1950), "Granulocytopenia following 'Chloramphenicol': Report on Two Cases", *M. J. AUSTRALIA*, 1: 768.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Courses at Bathurst and Wagga.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the following week-end courses will be held during April, 1956.

Bathurst.

In conjunction with the Western District Medical Association, the following course will be held in the Bathurst Town Hall. Saturday, April 21: 2 p.m., registration; 2.30 p.m., "Prolonged Labour: The Use of Pitocin Drip", Dr. J. N. Chesterman; 4 p.m., "Vascular Problems", Dr. John Loewenthal. Sunday, April 22: 10 a.m., "Some Aspects of Endocrinology", Dr. Keith Harrison; 11.30 a.m., "Some Aspects of Uterine Cancer", Dr. J. N. Chesterman; 2 p.m., "Surgical Potpourri", Dr. John Loewenthal; 2.45 p.m., "Treatment of Diabetic Patients", Dr. Keith Harrison; 3.30 p.m., combined quiz session, Dr. Brooke Moore (chairman), Dr. J. N. Chesterman, Dr. John Loewenthal and Dr. Keith Harrison. Those wishing to attend this course are

requested to notify Dr. Brooke Moore, 142 William Street, Bathurst, as soon as possible. Telephone: Bathurst 2345.

Fees.

Fees for attendance at both these courses are £3 3s.

Wagga.

In conjunction with the Southern District Medical Association, the following course will be held at the Wagga Base Hospital. Saturday, April 28: 2 p.m., registration; 2.30 p.m., "Surgical Management of Head Injuries", Dr. S. M. Morson; 4 p.m., "Recent Trends in Paediatrics", Dr. R. H. Vines. Sunday, April 29: 9.30 a.m., "Allergy in Skin Disorders", Dr. A. G. Finley; 10.45 a.m., "Epilepsy", Dr. S. M. Morson; 11.45 a.m., "Endocrine Disorders in Children", Dr. R. H. Vines; 2.30 p.m., "Skin Conditions Badly Treated in General Practice", by A. G. Finley.

Those wishing to attend this course are requested to notify Dr. John L. Tunley, Honorary Secretary, Southern District Medical Association, 53 Garwood Street, Wagga, as soon as possible. Telephone: Wagga 2941.

The College of Radiologists of Australasia.

EXAMINATIONS FOR DIPLOMA.

EXAMINATIONS for Part I of the diploma qualification of the College of Radiologists of Australasia may be taken in diagnostic and/or therapeutic radiology, and will commence on August 27, 1956. Examinations in Part I will be held in the capital cities of States in which candidates are resident, and in New Zealand cities by arrangement.

All candidates in Australia presenting for Part II must attend in Sydney for both written and practical examinations, which will commence on August 27, 1956, and which will, if possible, be completed within one week. New Zealand

candidates are to attend at a centre to be selected in New Zealand.

Entry forms must be received at the College office in Sydney not later than July 2, 1956, accompanied by the entry fee and all the necessary certificates. Incomplete entry forms or lack of appropriate certificates will cause rejection of the candidate's application.

Entry forms, together with the brochure of information containing the syllabus for the examinations, are available on request from the Secretary of the College of Radiologists of Australasia, 135 Macquarie Street, Sydney, also an additional sheet of information referable to examination details for the 1956 examinations.

The acquisition of the diploma entitles the holder to apply for membership of the College.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 11, of March 8, 1956.

NAVAL FORCES OF THE COMMONWEALTH. Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Appointment.—David Yeates Nelson is appointed Surgeon Lieutenant, dated 29th April, 1955.

ROYAL AUSTRALIAN AIR FORCE. Permanent Air Force: Medical Branch.

Pilot Officer Robert Hugo Mackay (036622) is transferred from the Reserve and appointed to a short-service commission, on probation for a period of twelve months, and is

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MARCH 17, 1956.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	4	6(4)							10
Amoebiasis									..
Ancylostomiasis									..
Anthrax									1
Bilharziasis				1					2
Brucellosis									37
Cholera									11
Chorea (St. Vitus)	1	1(1)							1
Dengue									..
Diarrhoea (Infantile)	1(1)	33(31)	3(1)						..
Diphtheria									..
Dysentery (Bacillary)		2(2)	8(7)						..
Encephalitis	1(1)								1
Filariasis									..
Homologous Serum Jaundice									1
Hydatid		1							314
Infective Hepatitis	142(80)	151(68)		14(8)	5(1)	1	1		..
Lead Poisoning									..
Leprosy									9
Leptospirosis									6
Malaria		1	5(5)						..
Meningococcal Infection	5(2)	1							..
Ophthalmia									..
Ornithosis									..
Paratyphoid		1(1)					2(2)		3
Plague									50
Pollomyelitis	11(6)	12(8)	2(1)	1	22(12)	2			1
Puerperal Fever		1							29
Rubella		24(19)		4	1(1)				2
Salmonella Infection					2(2)				4
Scarlet Fever	11(7)	10(6)	9(3)	6(4)		2		2	40
Smallpox									..
Tetanus			3(1)						3
Trachoma						3			4
Trichinosis									..
Tuberculosis	38(23)	20(15)	31(27)	6(6)	13(10)	6(2)			114
Typhoid Fever	1(1)								1
Typhus (Flea-, Mite- and Tick-borne)			2						2
Typhus (Louse-borne)									..
Yellow Fever									..

¹ Figures in parentheses are those for the metropolitan area.

promoted to the rank of Flight Lieutenant, 20th December, 1955.

Graham Chudleigh Fisk (0810757) is appointed to a short-service commission, on probation for a period of twelve months, 6th December, 1955, with the rank of Flight Lieutenant.

The resignation of Flight Lieutenant W. H. Koschade (0811678) is accepted, 23rd December, 1955.

Royal Australasian College of Surgeons.

ADMISSION OF NEW FELLOWS.

THE following, having satisfied the Court of Examiners, were admitted to Fellowship of the Royal Australasian College of Surgeons by the Council on January 30, 1956: Alexander Bruce Alder, Richard Allan Craven, Gavin James Douglas, John Kendall Francis, Alexander Falconer Grant, Norman Frank Greenslade, Nicholas Talbot Hamilton, Alan Boyd Holmes, Gordon Kerridge, John Patrick O'Neill.

Notice.

PHYSIOTHERAPY REGISTER.

THE following particulars were omitted from the Register of Practising Members (as at September 30, 1955) of the Australian Physiotherapy Association (New South Wales Branch), which was compiled for the use of medical practitioners and was issued recently.

City Area: Miss Kathleen Perrottet, 135-7 Macquarie Street (short-wave, ultra-violet, infra-red, diathermy) . . . BU 2205.

Hawthorn Area: Mrs. E. M. Reed, 6 Butlers Road, Hurstville (short-wave, infra-red, Faradic, ionization, ultra-violet, post-natal treatments, exercises, massage) . . . LU 2601.

Since the printing of the Register, the Association has been notified of the following change:

Ramsdale: Mrs. Ellen Goodman, of Ramsdale, has advised that she has ceased practice.

Dominions and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Hathaway, Anthony Clive, M.B., B.S., 1953 (Univ. Sydney), Haylock Street, Tullamore, New South Wales.

Medical Appointments.

Dr. I. S. Edwards has been appointed Quarantine Officer, Botany Bay, pursuant to the provisions of the *Quarantine Act*, 1908-1950.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

Lectures by Professor F. R. Winton.

Two open lectures will be given by Professor F. R. Winton, M.A., M.D., D.Sc., 1956 Visiting Professor of Pharmacology. Professor Winton is Professor of Pharmacology, University College, London, and Dean of the Faculty of Medicine. He

is a world authority on renal physiology and pharmacology. The lectures are as follows: Thursday, April 12, "The Measurement of Selective Effects of Drugs on Functions of the Cerebral Cortex". Thursday, April 19, "Pressures and Flows in the Kidney". Both lectures will be held in the Barn Lecture Theatre, outside the New Medical School, University of Sydney, commencing at 8 p.m. The lectures are open to students and members of the University staff, to the medical profession, and to anyone interested in this field of science. Admission is free and tickets are not required.

Diary for the Month.

- APRIL 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- APRIL 13.—Tasmanian Branch, B.M.A.: Branch Council.
- APRIL 13.—Queensland Branch, B.M.A.: Council Meeting.
- APRIL 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
- APRIL 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- APRIL 18.—Victorian Branch, B.M.A.: Branch Meeting.
- APRIL 18.—Western Australian Branch, B.M.A.: General Meeting.
- APRIL 19.—Victorian Branch, B.M.A.: Executive of Branch Council.
- APRIL 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
- APRIL 21.—Victorian Branch, B.M.A.: Country Branch Meeting.
- APRIL 24.—New South Wales Branch, B.M.A.: Ethics Committee.
- APRIL 26.—South Australian Branch, B.M.A.: Scientific Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.I.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 226 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 per annum within Australia and the British Commonwealth of Nations, and £6 10s. per annum within America and foreign countries, payable in advance.